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Cancer Commission of Harvard University

TWELFTH ANNUAL REPORT

OF THE

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL
FOR CANCER RESEARCH

AND OF THE

LABORATORIES

OF THE

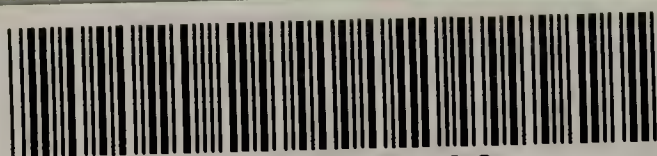
CANCER COMMISSION OF HARVARD UNIVERSITY

1923-1924

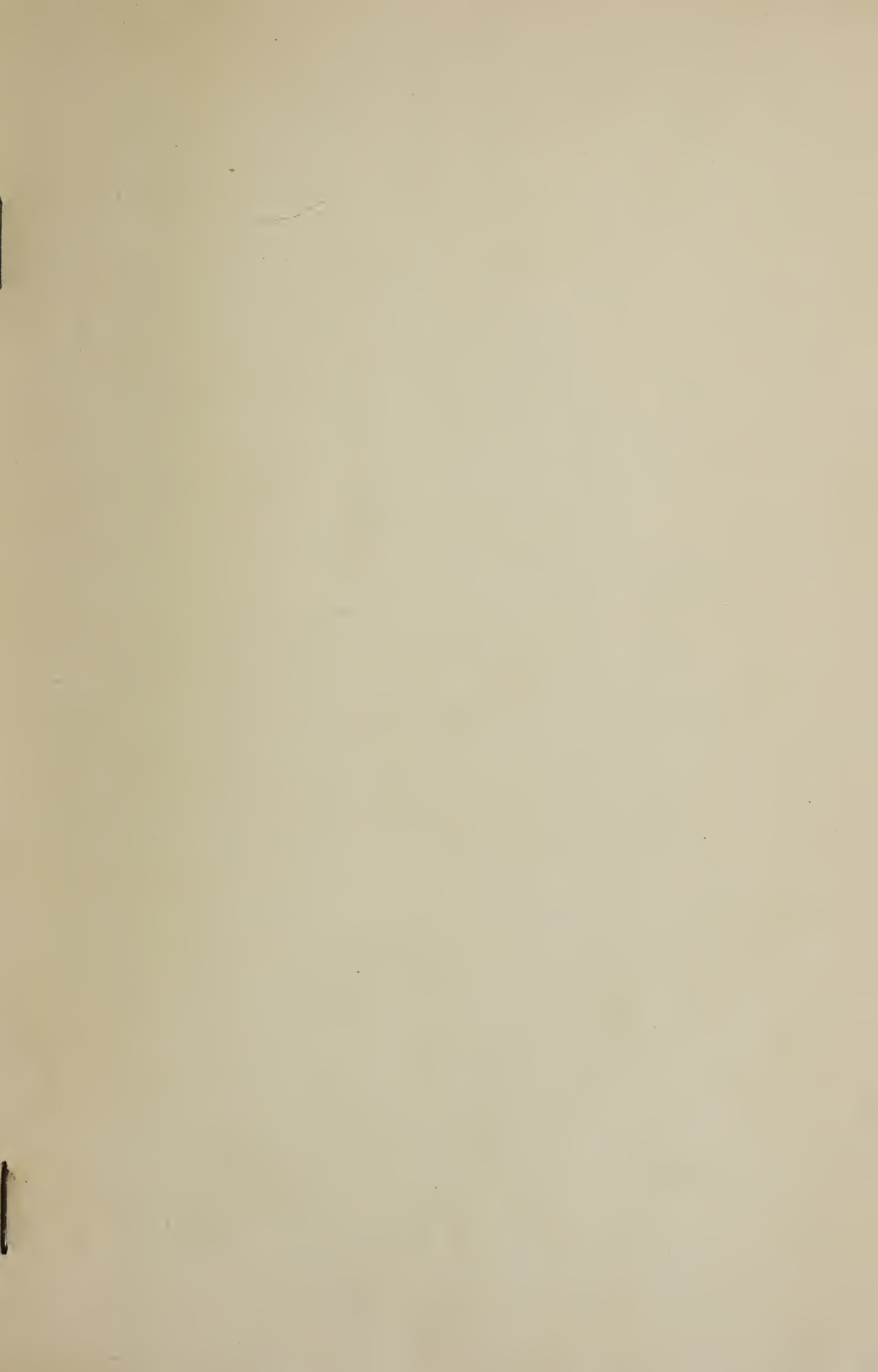
(FOR THE YEAR ENDING JUNE 30, 1924)

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THE COLLIS P. HUNTINGTON MEMORIAL HOSPITAL AND THE WARREN LABORATORY.

COOLIDGE & SHATTUCK, ARCHITECTS.

Cancer Commission of Harvard University

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FORM FOR DONATIONS AND BEQUESTS

I give, devise and bequeath unto the President and Fellows of Harvard College, the sum of \$. to be used for the work of the Cancer Commission of Harvard University.

In case the Commission should decide at any time that the cause and treatment of cancer had been sufficiently determined I authorize them to devote this bequest to some other unsolved problem of medicine.

THE
CANCER COMMISSION OF HARVARD UNIVERSITY
FOUNDED BY CAROLINE BREWER CROFT
JUNE 16, 1899

HENRY P. WALCOTT, M.D., *Chairman*

J. COLLINS WARREN, M.D. } For the Caroline Brewer Croft Fund.
M. DOUGLAS FLATTERY }
HENRY P. WALCOTT, M.D. } For the Corporation of Harvard College.
EDWARD H. BRADFORD, M.D. }
S. BURT WOLBACH, M.D. } For the Harvard Medical School.
E. E. TYZZER, M.D. }
ROBERT B. GREENOUGH, M.D., *Director*.
CHARLES JACKSON, *Treasurer*.
CHANNING C. SIMMONS, M.D., *Secretary*.
WILLIAM DUANE, PH.D., *Research Fellow in Physics*.
WILLIAM T. BOVIE, PH.D., *Research Fellow in Biophysics*.
E. LEON CHAFFEE, PH.D., *Research Fellow in Biophysics*.
CHARLES E. BARR, A.M., *Research Fellow in Biophysics*.
HENRY LYMAN, M.D., *Research Fellow in Chemistry*.
J. HOMER WRIGHT, M.D., *Pathologist in Charge of Free Diagnosis Service*.
PAUL RUPERT GAST, PH.D., M.S., *Assistant Research Fellow in Biophysics*.
WALTER S. HUGHES, S.B., *Assistant Research Fellow in Biophysics*.
TREVOR G. BROWNE, M.D., *Research Fellow in Pathology*.

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL
FOR CANCER RESEARCH

ROBERT B. GREENOUGH, M.D., *Surgeon in Charge*.
CHANNING C. SIMMONS, M.D., *Surgeon*.
HENRY A. CHRISTIAN, M.D., *Consulting Physician*.
GEORGE R. MINOT, M.D., *Physician*.
D. CROSBY GREENE, M.D., *Laryngologist*.
LAWRIE B. MORRISON, M.D., *Consulting Roentgenologist*.
GEORGE A. LELAND, JR., M.D., *Assistant Surgeon*.
GEORGE GILBERT SMITH, M.D., *Assistant Surgeon*.
ERNEST M. DALAND, M.D., *Surgeon to Out-Patients*.
LELAND S. MCKITTRICK, M.D., *Surgeon to Out-Patients*.
THOMAS E. BUCKMAN, M.D., *Assistant Physician*.
RAPHAEL ISAACS, M.D., *Assistant Physician*.
EDWARD W. HERMAN, M.D., *Assistant Laryngologist*.
ARTHUR M. GREENWOOD, M.D., *Assistant Dermatologist*.
M. C. SOSMAN, M.D., *Roentgenologist*.
R. G. VANCE, M.D., *Roentgenologist*.
WILLIAM L. DAVIS, M.D., *Surgical Assistant*.
WILLIAM M. SHEDDEN, M.D., *Surgical Assistant*.
EDWARD P. HAYDEN, M.D., *Resident Surgeon*.
JOSEPH V. MEIGS, M.D., *Resident Surgeon*.
JOHN S. LAWRENCE, M.D., *Resident Physician*.
DANIEL HIGBEE, M.D., *Resident Physician*.
BENJAMIN BROCK, M.D., *Resident Physician*.
RAYMOND REITZEL, M.D., *Resident Physician*.
RICHARD B. CATTELL, *House Officer*.
W. J. PAUL DYE, *House Officer*.
ANNA L. GIBSON, R.N., *Matron-Superintendent*.
MYRA B. CONOVER, R.N., *Assistant Matron-Superintendent*.

REPORT OF THE CHAIRMAN
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I submit herewith the reports of the various heads of departments of the staff of the Cancer Commission of Harvard University, for the fiscal year ending June 30, 1924.

A review of the work of the Commission has been prepared by the Director as a part of his report. This includes a brief statement of the general policy established by the Commission, and calls attention to several possible lines of activity which now present themselves for further extension of its work and to the financial support which will be needed for this purpose.

Respectfully,

HENRY P. WALCOTT, *Chairman.*

July 1, 1924.

THE REPORT OF THE DIRECTOR
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I have the honor to submit the following report on the work of the Cancer Commission of Harvard University for the twelve months ending July 1, 1924.

The regular work of the hospital and of the laboratories has been continued and a number of reports have been made by the various members of the Staff. The notable features of the year's work have been the development of the high voltage X-ray Department, the organization of the Medical Laboratory Department and the installation and operation of the X-ray apparatus presented to the hospital by the John Hancock Mutual Life Insurance Company, which has been employed both for diagnosis and for low voltage X-ray therapy.

The report for the fiscal year ending July 1, 1923, was prepared and printed in January, 1924. This report showed a gross deficit for the year of \$4,206.40. Owing to the change in the accounting system adopted July 1, 1923, the 1922-23 accounts were made to include thirteen months of hospital expense and fourteen months of salaries, whereas the income side of the account included only twelve months of income. The inclusion of these extra items was a necessary part of the change of the accounting system and the actual operation of the hospital and of the laboratories for the twelve months' period was accomplished without a deficit. The change in the accounting system has proved most satisfactory. Monthly reports are provided by the Bursar's office giving in detail the departmental receipts and expenditures and a much more accurate idea of the actual financial condition of the Commission's affairs is now obtainable than under the previous system. It has not however resulted in any material diminution of accounting expense.

The work of the fiscal year 1923-24 was carried on on estimates prepared and approved in May, 1923, and in general these estimates have been closely followed, although in certain depart-

ments the expenses have exceeded the figures presented at that time. Notably is this the case in three departments—Administration, House and Property and X-ray.

Under “Administration” is included the cost of clerical service which is required especially for the maintenance of the record system. Competent clerical service commands at present greater salaries than the Commission has been obliged to pay in the past and with normal increase in the work of the hospital and of the laboratories augmentation of the clerical staff has been necessary, and salaries have had to be increased also. A re-organization of this department has now been put through and all of the clerical work has been placed under the supervision of one chief clerk. In this way it is hoped that economy and more efficient service can be obtained. It should be noted also that under “Administration” has been charged off \$5,500.00 of accounts receivable, these being unpaid accounts more than one year old which have been carried as assets under the previous accounting system.

Under “House and Property” have been charged the items such as heat, light and power, supplied from the University power plant.

As has been pointed out in other reports these items are not at all under the control of the Cancer Commission and the costs are determined by the university engineers and allotted to the different institutions which depend upon this service.

With the new accounting system a subdivision of the accounts of the Physics Department was made into three Departments —

- (1) Radium Plant
- (2) Short Wave Length Therapy
- (3) X-ray Diagnosis

The cost of maintenance of the Radium Plant remained as in former years. The expenses of the Short Wave Length Therapy were increased materially by the breakage of X-ray tubes and amounted to nearly \$6,000 in the year, although yielding in revenue \$4,400. The operation of the new department of X-ray Diagnosis cost \$3,100 and registered only \$600 revenue so that the total cost of these two X-ray Departments was a considerable addition to the Commission expense.

Finances

\$103,500 was received as the second and final installment of the Elizabeth Worcester Mills Fund in August, 1923. Another bequest of \$2,078.89 under the will of Albert G. Geiger, available principal and interest, on the approval of the Corporation, was received under date of April 25, 1924. Annual subscriptions for the current year amounted to \$33,812.82 and the hospital receipts for the year were \$48,691.46, a very slight increase over the year before.

The use of the deep X-ray has supplanted somewhat the use of radium and receipts for radium treatment have fallen off to an extent greater than the X-ray receipts have increased. This is undoubtedly due to the fact that hospitalization of cases that are to receive deep X-ray treatment diminishes materially the number of beds available for treatment with radium.

Reports have been received from the heads of different departments which I will summarize as follows:

Bio-Physics — Dr. Duane

The work of Dr. Duane's department has been divided this year into three sub-departments — the radium plant, Short wave length X-ray Therapy, and X-ray Diagnosis.

The radium plant has taken charge of the collection of emanation and preparation of applicators not only for the Huntington Hospital but for the Massachusetts General Hospital as well. The arrangement started a year ago has continued and the Huntington Hospital has had the use of the emanation from the Massachusetts General Hospital radium when it was not in service elsewhere.

Dr. Duane and his assistants have devised an automatic clock control to provide for hourly automatic pumping of the emanation in place of daily operation by hand. This device diminishes the amount of time required of the operator and serves to diminish the risk of exposure as well.

Short wave length X-ray therapy: the high voltage X-ray plant has functioned satisfactorily and has been employed as a rule with two X-ray tubes running simultaneously, making it possible to give as many as six treatments per day. Each case receives, as a rule, four exposures of two to three hours on suc-

cessive days. This requires hospitalization of the patient for a full treatment but some fractional treatments have been given without requiring the patient to remain in the hospital. The results of the high voltage treatment appear to be similar to those obtained with other forms of X-ray apparatus although undoubtedly more powerful and more penetrating in their action. Benefit is obtained by the use of this apparatus in many of the deeper manifestations of malignant disease but that the results are more enduring has not yet been demonstrated. A further disadvantage in the use of the high voltage machine results from the risk of serious damage to the skin and subcutaneous tissues under repeated treatments. Late, deep X-ray burns have resulted in certain cases in which the patient's individual sensitiveness to X-ray appeared to be greater than normal.

The low voltage X-ray apparatus presented by the John Hancock Mutual Life Insurance Company has been installed and is in use giving low voltage treatments, and for making X-ray examinations. This apparatus makes it possible for us to complete the examination of new patients within the hospital, whereas up to this time we have been dependent upon either the Peter Bent Brigham Hospital or Dr. L. B. Morrison for such service. The cost of operation of this department at present exceeds the receipts but it is hoped to get it on a more self-supporting basis.

Under Dr. Duane, investigations have been carried on on the measurement of X-ray dosage and a number of papers have been published. With the aid of several National Research Fellows research on the physics of secondary and tertiary radiation have also been carried on and work has been done upon a special testing apparatus to be used for the protection of X-ray workers.

Dr. Duane received the first Leonard Prize of five hundred dollars (\$500) of the American Roentgen Ray Society for research in X-radiation.

Bio-Physics — Dr. Bovie

The work in Dr. Bovie's laboratories has included teaching and research. He has conducted four courses in the Bio-Physics

Department of Harvard College and he has given two courses in Bio-Physics in the Medical School. These courses have dealt chiefly with the investigation of problems in bio-physics and are, therefore, adapted especially to advanced students, although it has been found that a certain amount of elementary instruction in physics and biology was often necessary. Dr. Bovie is planning to write a Text Book on Bio-Physics in the near future.

The immediate applicability of Dr. Bovie's investigations to the cancer problem at first sight appears remote. There is great public interest in the nature of the actual cause of cancer and many articles appear in the public press upon this subject. At the present time, however, cancer must be regarded as a peculiar manner of growth of previously normal body cells. Our knowledge of the conditions which stimulate, retard or control growth of normal body cells is extremely limited. The work that Dr. Bovie is doing promises to shed some light upon these problems and from the control of the growth of normal cells to the control of cancer cells should be an easy step. It is for this reason that Dr. Bovie's investigations of the organization of protoplasm, the effects of surface tension phenomena, the photo-chemical changes in proteins produced by ultra-violet light, the electrical responses of the optic nerve to stimulation by light, and the photo-electric phenomena of plant growth all give promise of contributing to this general field of knowledge.

Eleven papers have been published from Dr. Bovie's laboratory during the year and other reports are in process of preparation. While these investigations are of the greatest importance in contributing to knowledge of growth of cells and thus are of importance in the cancer problem, they are important also in many other fields of science. It is greatly to be desired that the importance of this work should be recognized and the department of Bio-Physics established on a more permanent basis. While the importance of this subject is recognized in many other communities, endowment sufficient for its independent maintenance at Harvard has not yet been secured. Such a degree of independence will, however, undoubtedly come in time and until that time arrives it is believed that the support of these investigations is a proper and valuable function of the Cancer Commission.

Bio-Chemistry

Dr. Lyman reports that the work of his department has been carried on by his assistant, Mrs. M. L. Pearse, during his own absence on account of illness. Under Dr. Lyman's direction studies have been made of the nitrogen metabolism of cancer patients and in normal individuals, and a definite increase in undetermined nitrogen has been found in cancer cases confirming observations of other investigators; whereas other urinary constituents show no such increase. For the coming year certain investigations upon the physico-chemical changes in the blood of cancer patients will be undertaken.

Free Diagnosis Service

The Free Diagnosis Service maintained by the State of Massachusetts has continued to be conducted for the State Health Department by the Cancer Commission, and has been under the charge of Dr. J. Homer Wright. This service has attained a position of established value in the State, and a steadily increasing number of specimens have been sent in. During the past year improved methods of preparation have been introduced and the material thus made available for study and for teaching is of the highest value.

In addition to the State Service all of the pathological material of the Huntington Hospital goes through Dr. Wright's hands and special studies of groups of cases have been made in cooperation with members of the clinical staff.

Dr. G. Trevor Browne has held the position of Assistant in Pathology on a part time basis and has divided his work between the Pathological Department of the Harvard Medical School and the laboratory of the Cancer Commission.

Medical Laboratory

During the year 1923-24 the organization of the Clinical Laboratory of the Medical Department of the Huntington Hospital was completed and an efficient group of clinical research workers assembled under Dr. G. R. Minot. There are many problems in cancer which can be studied by the chemical, serological and microscopic methods of clinical investigation which have been developed in medical science in the past few

years. Some of this work was already established in connection with the employment of radiation in the treatment of leukemia and Hodgkin's disease, in which the study of the blood of the patient is the most important element in diagnosis and prognosis. Data of the greatest value were obtained also from the study of the blood of patients subjected to radiation either with radium or with the heavy X-ray. From these studies contributions of the utmost importance have been made by Dr. Minot and his co-workers, dealing not only with the diagnosis and treatment of these diseases but with the precautions necessary to prevent injury from radiation either to the patient or to the operator of the X-ray or radium apparatus.

During the past year these investigations have been continued and their scope enlarged and it is believed that this department of the Commission's activities is one which promises much for further accomplishment, and is deserving of vigorous support. A close relation has been established between the medical laboratory and the Department of Medicine of the Harvard Medical School and as in other departments of the Hospital this relationship is fostered on account of its educational value for students and its promotion of close cooperation with the School and with the other hospitals and laboratories which are affiliated.

Hospital Departments

The general conduct of the hospital during the past year is the same as in years gone by and no change in general policy has been necessary. The number of new patients coming to the hospital continues to increase year by year and a wealth of clinical material passes through the institution which provides opportunity for the study of selected groups of cases which is unsurpassed. The method of special assignment of groups of cases to different members or groups of members of the staff is continued and reports have been prepared and published in various medical journals which reflect credit upon the institution as well as upon the individuals concerned.

The arrangement made with the John Hancock Mutual Life Insurance Company has continued and has been extended to include the examination of their employees as well as their policy holders for suspected cancer. It is believed that this is a

type of public service which may be productive of great good, not only for the safeguarding of the health of the individual but for its educational value as well.

The Matron-Superintendent of the hospital, Miss Gibson, has continued her excellent and economical administration of the physical affairs of the institution. During a part of the year the Assistant Matron-Superintendent, Miss Conover, was away on other duty but has now returned to take up her regular work as an able and efficient assistant to the Matron-Superintendent.

The increased cost of operation of certain departments has been the inevitable result of the increased number of patients and of the increase in our resources to deal with their diseases. Insofar as the Matron-Superintendent's departments are concerned, however, the estimates of May, 1923, have proved surprisingly accurate.

In response to the request of the Chairman of the Commission a statement of the work of the Cancer Commission has been prepared, as a part of this report; this statement includes a brief history of the development of the work of the Commission and gives a summary of the work going on in the investigation of the cause of cancer and of its treatment, and a forecast of the work which is desired to undertake in the near future and of the support needed to make it possible thus to extend the work of the Commission.

THE CANCER COMMISSION OF HARVARD UNIVERSITY

The Cancer Commission of Harvard University was founded in 1899 on a bequest by Caroline Brewer Croft for the study of the cause and the treatment of cancer. In 1912 other funds were contributed to the work of the Commission and the Collis P. Huntington Memorial Hospital was built for the study and treatment of cancer patients. During the earlier years of the Commission's work investigations were carried on in the laboratories of the Harvard Medical School which had to do with the then much discussed question of a possible parasitic cause of cancer. As sufficient evidence to support such a theory was not obtained, investigations were taken up of the spontaneous and

inoculable tumors of animals, especially rats and mice, and under Professor E. E. Tyzzer contributions of great value were made to the tumor problem.

With the construction of the Huntington Hospital and the advent of radium and x-ray as agents for the treatment of cancer, a new department of investigation came into existence, that of Bio-Physics. For this work the Harvard Cancer Commission was peculiarly well equipped by reason of its personnel, which included Professor William Duane, an acknowledged expert in the physics of radio-activity and Professor W. T. Bovie, a trained biologist who had studied the phenomena of plant and animal growth by physical methods. Under this department the application of x-ray and radium to the effective treatment of cancer was studied in the hospital and methods for its safe administration were devised; while in the laboratory investigations of the effects of radiation on the living tissues of plants and animals were made at the same time.

In 1922, the J. Collins Warren Laboratory of Bio-Physics was completed and for the first time all of the work of the Commission was assembled under one roof with facilities for the effective treatment of patients with x-ray, radium or surgery as might be desired, as well as laboratories for the investigation of the various problems in chemistry, pathology and bio-physics which presented themselves as likely to contribute toward the solution of the cancer problem.

Bio-physics deals with the organization of living tissues in the light of present day physical conceptions of the elementary composition of matter and although as yet in its infancy as a separate branch of science, it promises to yield results of the most fundamental importance in connection with the growth of living tissues and with such functions as nutrition and reproduction upon which growth depends. For the further development of this line of investigation, funds have been contributed to permit the erection of a glass-house as an addition to the laboratory of bio-physics and when this is completed plant and animal growth can be studied in the laboratory in the same way that patients with cancer are studied in the hospital.

During the past year a special laboratory has been assigned to the new department of clinical investigation under Dr. G. R. Minot. This medical laboratory has a corps of

investigators trained in the application to clinical problems of the methods of physiological, chemical and physical science and studies of great importance have been made of the effects of radiation upon the normal individual, and upon the fundamental blood diseases which are closely allied to malignant growths. Work has also been done in the broad field of cellular biology by making use of the blood cells as test objects and studying their growth and form in relation to disease and to different therapeutic methods.

Up to the present time 176 papers have been published in scientific journals embodying the results of the work of the different members of the Cancer Commission. The policy established by the Commission is as follows: to carry on investigation both in the laboratory and in the clinic, with a view to the study of the nature of cancer, to the development of new methods of treatment of this disease, and to the better utilization of the methods now available. These methods have been applied in the actual treatment of patients afflicted with cancer. Records of the results of treatment have been made, a follow-up system has been established in order that knowledge of the end-results of treatment may be made available for record, and reports of series of cases of cancer in its different locations have been prepared and presented from time to time. It is believed that only in some such manner as this can certain and reliable progress be made in dealing with this complex problem.

With the completion of the work for the fiscal year 1923-1924, certain lines of development have become highly desirable for the further extension of the usefulness of the Commission.

An increase of \$20,000 a year in the general funds available for the maintenance of the regular work of the Commission is greatly needed. The work of the past year resulted in a deficit of nearly \$10,000 and there is no part of the program of the past year's work, either in the laboratory or in the clinic, which can be abandoned, without interfering seriously with the program already established. Salaries and wages now paid by the Commission are far below those available in similar institutions in other cities and the cost of materials appears to be slowly but steadily increasing. For the effective utilization of the new glass-house in the laboratory of Bio-Physics, additional funds will also be greatly needed.

A development of the Department of Pathology is much to be desired. At present our resources permit the employment only of half of the time of a junior pathologist. The work of the institution would merit the full time appointment of a pathologist with the necessary assistants and technicians, amounting in all to at least \$10,000 a year. While much assistance has been given to us by Dr. Wolbach, the Professor of Pathology in the Harvard Medical School, and by Dr. J. H. Wright, Associate Professor of Pathology and Pathologist in charge of the State Diagnosis Service, this has been done voluntarily and without compensation.

A chemical laboratory has been maintained in the institution by Dr. Henry Lyman. Dr. Lyman's work has been interrupted unavoidably in the past three years. He has continued his interest and has maintained a technician for the study of certain bio-chemical problems, but circumstances have caused very little activity in this department. Recent developments in bio-chemistry appear to warrant a much more intensive study of certain phenomena in relation to cancer. It is believed that a full-time chemist working in cooperation with the surgical, medical and pathological departments would contribute materially to an increase in our knowledge of cancer. Such a department would cost at least \$10,000 a year and funds for the organization of this work are not available at present.

The problem of increasing the resources of the institution by \$40,000 a year is a difficult one. Already annual subscriptions to the amount of about \$40,000 are being received. An increase of the invested funds of the Commission sufficient to give this return would have to be in the neighborhood of a million dollars. Such a sum would have to be regarded as an investment, the returns from which would presumably be slow.

It is believed, however, that if suitable funds were available the result of their careful expenditure would be to increase materially our knowledge of cancer, and it is upon such an increase in knowledge that all prospect of the effective control of the condition ultimately must be based. Without more funds the staff of the Commission cannot broaden their lines of work and take up such new investigations as offer promise of valuable returns. To maintain progress in this work it is essential to

have sufficient money adequately to maintain the present work, and to permit of its elastic expansion as new fields develop.

Cancer is increasing and for the benefit of mankind cooperative intensive studies are urgently demanded. The solution of the problem of cancer cannot be bought with money but its advent can be hastened by this means. Investigations may at times seem far removed from the immediate problem but the foundations of all the great advances in cure and prevention of disease have been laid by basic scientific studies. Success will follow only if workers have special knowledge and training and if biological, chemical, pathological and clinical studies can be made co-ordinately. Such work demands the continued activity in research centers of as many workers as possible who can be given the necessary salaries and supplies. Money wisely spent for serious study of these subjects may confidently be expected ultimately to lead to a decreasing mortality from cancer, and to the control of this disease.

ROBERT B. GREENOUGH, *Director*.

July 1, 1924.

REPORT OF THE SURGEON

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: The work of the Collis P. Huntington Memorial Hospital was carried on during the fiscal year of 1923-1924 by the following staff:

ROBERT B. GREENOUGH, M.D., *Surgeon in Charge.*
 CHANNING C. SIMMONS, M.D., *Surgeon.*
 HENRY A. CHRISTIAN, M.D., *Consulting Physician.*
 GEORGE R. MINOT, M.D., *Physician.*
 D. CROSBY GREENE, M.D., *Laryngologist.*
 LAWRIE B. MORRISON, M.D., *Consulting Roentgenologist.*
 GEORGE A. LELAND, JR., M.D., *Assistant Surgeon.*
 GEORGE GILBERT SMITH, M.D., *Assistant Surgeon.*
 ERNEST M. DALAND, M.D., *Surgeon to Out-Patients.*
 LELAND S. MCKITTRICK, M.D., *Surgeon to Out-Patients.*
 THOMAS E. BUCKMAN, M.D., *Assistant Physician.*
 RAPHAEL ISAACS, M.D., *Assistant Physician.*
 EDWARD W. HERMAN, M.D., *Assistant Laryngologist.*
 ARTHUR M. GREENWOOD, M.D., *Assistant Dermatologist.*
 M. C. SOSMAN, M.D., *Roentgenologist.*
 R. G. VANCE, M.D., *Roentgenologist.*
 WILLIAM L. DAVIS, M.D., *Surgical Assistant.*
 WILLIAM M. SHEDDEN, M.D., *Surgical Assistant.*
 EDWARD P. HAYDEN, M.D., *Resident Surgeon.*
 JOSEPH V. MEIGS, M.D., *Resident Surgeon.*
 JOHN S. LAWRENCE, M.D., *Resident Physician.*
 DANIEL HIGBEE, M.D., *Resident Physician.*
 BENJAMIN BROCK, M.D., *Resident Physician.*
 RAYMOND REITZEL, M.D., *Resident Physician.*
 RICHARD B. CATTELL, *House Officer.*
 W. J. PAUL DYE, *House Officer.*
 ANNA L. GIBSON, R.N., *Matron-Superintendent.*
 MYRA B. CONOVER, R.N., *Assistant Matron-Superintendent.*

In addition to the regular staff members of several departments of the Harvard Medical School have given valuable aid in the capacity of consultants. We wish especially to thank Dr. G. S. Derby, Dr. R. B. Osgood, Dr. Philip D. Wilson and Dr. C. Morton Smith. Since the installation of the new X-ray apparatus, given to the Hospital by the John Hancock Mutual Life Insurance Company, Dr. L. B. Morrison has not been called upon to treat cases requiring low voltage radiation, as in former years, or to do the diagnostic work. He has, however, taken an active interest in the X-ray department in the capacity of a

consultant to the Hospital. The department has been in charge of Dr. M. C. Sosman, who later resigned owing to press of work at the Peter Bent Brigham Hospital, and his place was filled by Dr. R. G. Vance.

During the year 1629 new cases were examined at the hospital, 30 more than in the previous year. There were 7,391 Out-Patient visits as compared to 7,748 in 1923-24 and 6,342 In-Patient days as against 6,115 in the last fiscal year.

Forty-two policy holders of the John Hancock Mutual Life Insurance Company were examined for suspected carcinoma, of which 12 were found to be suffering from the disease.

The following table shows the number of cases treated yearly since the foundation of the hospital:

<i>Year</i>	<i>Number Patients</i>	<i>O.P.D. Visits</i>	<i>In-patient Days</i>	<i>Operating Expenses</i>	<i>Total Hospital Earnings</i>
1912-1913	190*	482	5,372	\$23,358.41	\$4,053.19
1913-1914	360*	1,634	5,529	26,115.62	4,607.72
1914-1915	509*	3,676	5,725	25,278.78	9,811.08
1915-1916	508†	3,833	6,118	26,888.36	13,078.08
1916-1917	571†	4,488	6,602	29,266.00	15,176.46
1917-1918	767†	4,286	6,660	29,791.39	16,006.98
1918-1919	901†	4,420	6,484	33,692.45	20,744.18
1919-1920	1,286†	6,105	7,054	47,361.97	30,147.13
1920-1921	1,420†	6,820	6,511	66,157.03	39,143.41
1921-1922	1,636†	7,331	5,466	65,450.60	46,930.12
1922-1923	1,599†	7,748	6,115	72,332.09	47,714.00
1923-1924	1,629†	7,391	6,342	80,233.14	48,691.46

*Old and new patients.

†New patients only.

The classification of new patients presenting themselves at the clinics during the year is presented below in tabular form, arranged according to the classification of diseases adopted by the Boston hospitals and based on the numbers in the International List of Causes of Death.

	<i>Male</i>	<i>Female</i>	<i>Total</i>
CARCINOMA			
Breast 7-47a	0	95	95

Buccal Cavity.....7-43a			
Cheek.....	12	3	15
Jaw, lower.....	13	2	15
Jaw, upper.....	10	2	12
Lip.....	46	1	47
Palate.....	6	1	7
Submaxillary gland.....	1	0	1
Tongue, floor of mouth.....	52	4	56
Tonsil.....	18	4	22
Total.....7-43a	158	17	175

Female Genital Organs.....7-46a			
Cervix uteri.....	0	162	162
Ovary.....	0	11	11
Uterus.....	0	24	24
Vagina.....	0	8	8
Vulva.....	0	9	9
Total.....7-46a	0	214	214

Male Genital Organs.....7-49a			
Penis.....	7	0	7
Prostate.....	5	0	5
Total.....7-49a	12	0	12

Peritoneum, Intestines, Rectum, etc.....7-45a			
Intestine.....	2	4	6
Peritoneal Carcinomatosis.....	0	1	1
Rectum.....	26	12	38
Sigmoid.....	1	0	1
Total.....7-45a	29	17	46

	<i>Male</i>	<i>Female</i>	<i>Total</i>
CARCINOMA (<i>Continued</i>)			
Skin.....7-48a			
Abdomen.....	1	0	1
Arm.....	1	1	2
Cheek.....	56	44	100
Chin.....	2	1	3
Ear.....	21	2	23
Eyebrow.....	1	1	2
Eyelid.....	15	13	28
Face.....	3	2	5
Foot.....	0	1	1
Forehead.....	13	16	29
Hand.....	5	2	7
Leg.....	0	1	1
Lip.....	14	2	16
Mastoid Region.....	3	0	3
Neck.....	9	4	13
Nose.....	31	36	67
Scalp.....	1	3	4
Temple.....	3	1	4
Total.....7-48a	179	130	309

Stomach, Liver, etc. 7-44a			
Esophagus.....	12	8	20
Hypopharynx.....	1	0	1
Nasopharynx.....	2	0	2
Pharynx.....	3	3	6
Stomach.....	4	5	9
Total.....7-44a	22	16	38

Urinary Organs.....7-49a			
Bladder.....	3	0	3
Kidney.....	1	0	1
Urethra.....	0	2	2
Total.....7-49a	4	2	6

Other Sites.....7-49a			
Antrum.....	0	3	3
Branchial Cleft.....	5	1	6
Ethmoid.....	3	0	3
Larynx.....	27	0	27
Pelvis, metastatic.....	0	1	1
Thyroid gland.....	1	0	1
Total.....7-49a	36	5	41

	<i>Male</i>	<i>Female</i>	<i>Total</i>
CARCINOMA (<i>Continued</i>)			
Cylindroma.....7-49c	0	1	1
Lacrimal gland			
Embryoma.....7-49g			
Testicle.....	1	0	1
SARCOMA (Unspecified)			
Antrum.....7-49f	1	0	1
Breast.....7-47f	0	1	1
Choroid.....7-49f	0	1	1
Eyelid.....7-48f	1	0	1
Hand.....7-48f	1	0	1
Kidney.....7-49f	0	2	2
Nose.....7-49a	1	0	1
Palate.....7-43f	1	0	1
Angiosarcoma			
Finger.....7-48f	1	0	1
Leg.....7-48f	1	0	1
Scalp.....7-48f	1	1	2
Fascial Sarcoma			
Leg.....7-48f	0	1	1
Fibrosarcoma			
Arm.....7-48f	0	1	1
Back.....7-48f	1	0	1
Groin.....7-49f	1	0	1
Hand.....7-48f	1	0	1
Rectal Region.....7-45f	0	1	1
Scalp.....7-48f	0	1	1
Sciatic nerve.....7-49f	1	0	1
Melanotic Sarcoma			
Alveolar process.....7-43f	1	0	1
Axilla.....7-48	1	0	1
Back.....7-48f	1	1	2
Eye.....7-49f	0	1	1
Foot.....7-48f	0	1	1
Forehead.....7-48f	0	1	1
Neck.....7-48a	0	2	2
Scalp.....7-48f	1	0	1
Osteogenic Sarcoma			
Femur.....7-49f	1	1	2
Jaw.....7-43f	1	0	1
Metacarpal.....7-49f	3	0	3
Pelvis.....7-49f	2	0	2
Rib.....7-49f	1	0	1
Scapula.....7-49f	1	0	1
Tibia.....7-49f	0	1	1
Total.....	25	17	42

	<i>Male</i>	<i>Female</i>	<i>Total</i>
ENDOTHELIOMA			
Lymph Nodes.....7-49b	1	0	1
HEMANGIO-ENDOTHELIOMA			
Shoulder.....7-49b	0	1	1
HYPERNEPHROMA			
Kidney.....7-49e	1	1	2
MALIGNANT DISEASE (Unspecified)...7-49	4	3	7
MALIGNANT LYMPHOMA.....7-65.2	18	9	27
LYMPHOSARCOMA.....7-65.2	5	2	7
MIXED MALIGNANT GROWTH			
Parotid.....7-43g	1	4	5
MULTIPLE MYELOMA.....7-49k	1	0	1
NEUROBLASTOMA			
Eye.....7-85	0	2	2
Total.....	31	22	53

NON-MALIGNANT TUMORS			
Adamantinoma			
Jaw.....7-49f	2	1	3
Adenofibroma			
Breast.....7-142	1	1	2
Adenoma			
Nose.....7-97	1	0	1
Thyroid.....7-60	0	1	1
Angioma			
Lip.....7-108	4	1	5
Skin.....7-154	5	11	16
Palate, parotid, tongue.....7-108	3	2	5
Angioma cavernosum			
Forehead.....7-154	1	1	2
Lip.....7-108	0	1	1
Neck.....7-154	0	1	1
Multiple.....7-154	0	1	1
Cyst Mucous			
Lip.....7-108	2	0	2
Cyst-adenoma, papillary			
Breast.....7-142	0	2	2
Epulis			
Jaw.....7-155	1	2	3
Forward.....	20	25	45

	<i>Male</i>	<i>Female</i>	<i>Total</i>
NON-MALIGNANT TUMORS (<i>Continued</i>)			
Brought forward.....	20	25	45
Fibroma			
Ear.....7-86	0	1	1
Mouth.....7-108	1	0	1
Nose.....7-97	1	0	1
Palate.....7-108	1	0	1
Multiple.....7-154	0	1	1
Vulva.....7-141	0	1	1
Fibromyoma			
Uteri.....7-139	0	16	16
Giant Cell Tumor			
Ilium.....7-155	1	0	1
Jaw.....7-43a	0	1	1
Thumb.....7-43f	0	1	1
Keloid			
Buttocks.....7-154	1	0	1
Chest.....7-154	2	1	3
Chin.....7-154	1	0	1
Ear.....7-86	1	0	1
Elbow.....7-154	0	1	1
Groin.....7-154	1	0	1
Hand.....7-154	1	1	2
Leg.....7-154	1	0	1
Neck.....7-154	1	0	1
Thigh.....7-154	1	0	1
Wrist.....7-154	0	1	1
Lipoma			
Cheek.....7-154	1	0	1
Thigh.....7-154	0	1	1
Multiple.....7-154	1	0	1
Lymphangioma			
Eyelid.....7-154	1	0	1
Palate.....7-99	0	1	1
Lymphoma, benign			
Neck, groin.....7-50	1	0	1
Neurofibromatosis			
Hand.....7-154	0	1	1
Osteoma			
Orbit.....7-85	0	1	1
Papilloma			
Lip.....7-108	4	1	5
Skin.....7-154	13	15	28
Tongue.....7-108	1	0	1
Uvula.....7-109	0	1	1
Vagina.....7-141	0	1	1
Polyp			
Cervix uteri.....7-139	0	5	5
Vocal cord.....7-98	1	0	1
Wen.....7-154	7	7	14
Total.....	64	84	148

	<i>Male</i>	<i>Female</i>	<i>Total</i>
SPECIAL SKIN DISEASES			
Acne Rosacea.....IO-154	0	2	2
Acne Vulgaris.....IO-154	1	0	1
Cicatrix.....IO-154	1	2	3
Clavus.....IO-154	1	0	1
Eczema.....IO-154	3	1	4
Erythremia.....IO-154	0	1	1
Folliculitis.....IO-154	0	1	1
Intertrigo.....IO-154	0	2	2
Keratosis (unqualified).....IO-154	50	32	82
Lichen planus.....IO-154	1	0	1
Lupus.....IO-154	1	0	1
Lupus erythematosus.....IO-154	1	2	3
Nevus araneus.....IO-159	1	0	1
Nevus cellular.....IO-159	0	1	1
Nevus papillaris.....IO-159	2	5	7
Nevus pigmentosus.....IO-159	4	5	9
Nevus pilosus.....IO-159	2	1	3
Nevus vascularis.....IO-159	0	1	1
Nevus (unqualified).....IO-159	1	4	5
Pruritis.....IO-154	0	1	1
Psoriasis.....IO-154	2	0	2
Sarcoid.....IO-154	1	0	1
Sycosis vulgaris.....IO-154	1	0	1
Verruca.....IO-154	14	8	22
Xanthoma palpebrarum.....IO-154	0	2	2
Total.....	87	71	158
OTHER CONDITIONS			
SECTION I. SPECIFIC INFECTIOUS DISEASES,			
GENERAL DISEASES			
Abscess			
Breast.....I-142	0	1	1
Peritonsillar.....I-109	0	1	1
Tongue.....I-108	1	0	1
Actinomycosis			
Lung, chest wall.....I-30	1	0	1
Tongue.....I-30	0	1	1
Epidermophytosis			
Multiple.....I-30	1	0	1
Lupus vulgaris.....I-36	1	1	2
Syphilis.....I-38	9	4	13
Tuberculosis			
Epiglottis.....I-31	1	0	1
Larynx.....I-31	3	0	3
Lungs.....I-31	1	0	1
Lymph nodes, axillary.....I-36.3	1	0	1
Lymph nodes, cervical.....I-36	3	4	7
Palate.....I-36	1	0	1
Shoulder, joint.....I-35	0	1	1
Tongue.....I-36	1	0	1
Impetigo contagiosa.....I-154	1	0	1
Furuncle.....I-152	3	0	3
Ulcer.....I-154	1	0	1
Forward.....	29	13	42

	<i>Male</i>	<i>Female</i>	<i>Total</i>
OTHER CONDITIONS (<i>Continued</i>)			
Brought forward.....	29	13	42
SECTION VI. POISONINGS, INTOXICATIONS			
Lead poisoning.....6-67	1	0	1
SECTION V. DISEASE DUE TO PHYSICAL AGENTS			
Burn..... 5-179	1	0	1
SECTION VIII. CONGENITAL MALFORMATIONS			
Thyro-glossal cyst.....8-159	1	2	3
Pilonidal cyst, nose.....8-159	1	0	1
SECTION IX. INJURIES			
Fracture			
Clavicle.....9-185	0	1	1
Malar bone 9-201	0	1	1
SECTION XII. DISEASE OF THE LYMPHATIC SYSTEM			
Lymphadenitis.....12-94	2	3	5
SECTION XIII. DISEASES OF THE BLOOD AND BLOOD FORMING ORGANS			
Anemia, pernicious.....13-58.1	1	1	2
Anemia, splenic.....13-58	0	1	1
Hemophilia.....13-69	1	0	1
Leukemia, atypical.....13-65.1	0	1	1
Leukemia, lymphoid.....13-65.1	6	1	7
Leukemia, myeloid.....13-65.1	7	6	13
Polycythemia.....13-69	3	0	3
Purpura hemorrhagica.....13-69	2	3	5
SECTION XIV. DISEASES OF THE DUCTLESS GLANDS			
Goitre.....14-60.2	0	2	2
Hyperthyroidism.....14-60	0	1	1
SECTION XV. DISEASES OF THE NERVOUS SYSTEM			
Mastodynia.....15-82	0	2	2
Paralysis.....15-10	1	0	1
SECTION XVI. DISEASE OF THE BONES, JOINTS, MUSCLES, TENDONS AND FASCIA			
Arthritis, hypertrophic.....16-156	1	2	3
Bursitis.....16-158	1	0	1
Dupuytren's contraction.....16-158	1	0	1
Flat foot.....16-158	0	1	1
Osteitis, deformans.....16-155	1	0	1
Osteoarthritis.....16-156	1	0	1
Osteomyelitis.....16-155	1	4	5
Forward.....	62	45	107

	Male	Female	Total
OTHER CONDITIONS (<i>Continued</i>)			
Brought forward.....	62	45	107
SECTION XVII. DISEASE AND INJURIES OF THE EYE AND EAR			
Conjunctivitis.....17-85	1	1	2
Dacryocystitis.....17-85	0	1	1
Hordeolum.....17-85	1	0	1
Retinitis.....17-85	1	0	1
Sinusitis and Otitis.....17-85	1	0	1
Inflammation, chronic.....17-86	0	1	1
SECTION XVIII. DISEASE OF THE NOSE AND ACCESSORY SINUSES			
Deviation of nasal septum.....18-97	0	1	1
Epistaxis of deviated septum.....18-97	1	0	1
Ethmoiditis.....18-155	1	0	1
Rhinitis.....18-97	1	0	1
Rhinolith.....18-97	1	0	1
Sinusitis, chronic.....18-155	0	1	1
Ulcer, nose.....18-97	1	0	1
SECTION XIX. DISEASE OF THE MOUTH, LIPS, CHEEKS, PHARYNX, TONSILS AND PALATE			
Concretion.....19-108	0	1	1
Inflammation.....19-108	0	3	3
Leukoplakia.....19-108	17	1	18
Parotitis.....19-108	0	1	1
Pharyngitis.....19-109	1	0	1
Tonsillitis.....19-109	1	2	3
Ulcer, lip.....19-108	1	0	1
Ulcer, mouth.....19-108	1	0	1
SECTION XX. DISEASE OF THE JAW, TEETH AND GUMS			
Pyorrhea alveolaris.....20-108	1	1	2
SECTION XXI. DISEASES OF THE TONGUE			
Glossitis.....21-108	1	1	2
Hypertrophied papilla.....21-108	1	3	4
Leukoplakia of tongue.....21-108	2	1	3
Ulcer of tongue.....21-108	0	2	2
SECTION XXII. DISEASES OF THE ESOPHAGUS			
Stricture.....22-110	1	1	2
Cardiospasm.....22-112	0	1	1
SECTION XXIII. DISEASES OF THE STOMACH			
Gastritis, chronic.....23-112	1	0	1
Hyperacidity.....23-112	1	1	2
SECTION XXIV. DISEASES OF THE INTESTINES			
Appendicitis.....24-117	0	2	2
Constipation.....24-119	1	1	2
Forward.....	101	72	173

	Male	Female	Total
OTHER CONDITIONS (<i>Continued</i>)			
Brought forward.....	101	72	173
Enteroptosis.....24-119	0	2	2
Indigestion.....24-114	1	0	1
Obstruction.....24-118.2	0	1	1
Stasis, intestinal.....24-119	1	0	1
Ulcer, duodenal.....24-111.2	3	3	6
SECTION XXV. DISEASES OF THE LIVER AND GALL DUCTS			
Cholecystitis.....25-124	1	1	2
Cholelithiasis.....25-123	0	1	1
SECTION XXVIII. DISEASES OF RECTUM AND ANUS			
Fissure in ano.....28-119	1	0	1
Fistula in ano.....28-119	1	0	1
Hemorrhoid.....28-93	1	1	2
SECTION XXIX. DISEASES OF THE LARYNX			
Laryngitis.....29-98	1	0	1
Neurosis.....29-98	2	0	2
Paralysis.....29-98	1	0	1
SECTION XXX. DISEASES OF THE TRACHEA AND BRONCHI			
Bronchiectasis.....30-99.2	2	0	2
SECTION XXXIV. DISEASES OF THE BLADDER			
Cystitis.....34-133	0	2	2
Incontinence.....34-133	0	1	1
SECTION XXXV. DISEASES OF THE URETHRA, MALE AND FEMALE			
Caruncle, urethra.....35-134	0	6	6
Urethritis, chronic.....35-134	0	1	1
SECTION XXXVI. DISEASES OF THE MALE GENERATIVE ORGANS			
Fibrosis of corpora cavernosa.....36-138	2	0	2
SECTION XXXVII. DISEASES OF THE FEMALE GENERATIVE ORGANS			
Amenorrhea.....37-141	0	1	1
Dysmenorrhea.....37-141	0	3	3
Endocervicitis.....37-141	0	4	4
Endometritis.....37-141	0	5	5
Erosion cervix uteri.....37-141	0	2	2
Fistula vesico vaginal.....37-141.2	0	1	1
Kraurosis vulvae.....37-141	0	1	1
Laceration.....37-141	0	4	4
Menopause.....37-141	0	2	2
Oophoritis, cystic.....37-141	0	1	1
Relaxation pelvic floor.....37-141	0	3	3
Forward.....	118	118	236

	<i>Male</i>	<i>Female</i>	<i>Total</i>
OTHER CONDITIONS (<i>Continued</i>)			
Brought forward	118	118	236
SECTION XXXIX. DISEASES OF THE BREAST			
Cystic disease	1	11	12
Paget's disease	0	1	1
SECTION XLI. ILL-DEFINED OR UNCLASSIFIED DISEASES			
No diagnosis	10	17	27
No disease	7	7	14
Total	136	154	290

CARCINOMA	
Breast	95
Buccal Cavity	175
Female Genital Organs	214
Male Genital Organs	12
Peritoneum, Intestines and Rectum, etc.	46
Skin	309
Stomach and Liver, etc.	38
Urinary Organs	6
Other Sites	43
	938
Carcinoma	938
Sarcoma	42
Other Malignant Tumors	53
Non-Malignant Tumors	148
Special Skin Diseases	158
Other Conditions	290
	1,629

Five hundred and eighteen operations were performed at the hospital during the year. Many of them were of a minor nature but a large number were major and were cases which required treatment by surgery and radiation combined. The proper radiation treatment of certain cases is in the nature of a major surgical operation and it is becoming recognized that a combination of the two methods is the treatment giving the best results in certain groups of cases. Cases requiring purely surgical treatment are usually referred to other institutions.

The general conduct of the clinics has been the same as in former years and it is gratifying to see that more patients are referred for precancerous lesions or very early cancer than was the case a few years ago. The clinics are held as follows:

Monday afternoon.	Diseases of the blood and lymph glands.
Tuesday afternoon.	General surgical clinic.
Wednesday morning.	Diseases of the blood and lymph glands.
Wednesday afternoon.	Carcinoma of the nose and throat.
Thursday morning.	Carcinoma of the genito-urinary organs.
Thursday afternoon.	Carcinoma of the female genital organs.
Friday afternoon.	General surgical clinic.

Several reports have been made before medical societies by members of the staff during the year and many of the papers published. Individual members of the staff have assisted in the statistical study of cancer of certain regions inaugurated by the American College of Surgeons. Dr. Greenough has collected and reported on a series of cases of carcinoma of the cervix from hospitals throughout the country and work is now under way on a similar series of cases of cancer of the breast and of cancer of the mouth.

In August, 1923, the Assistant Superintendent, Miss Myra B. Conover, resigned in order to take charge of the Thorndike Laboratories at the Boston City Hospital. She resumed her duties at the Huntington Hospital in February, 1924.

In May, 1924, the clerical force of the hospital was re-organized and the work is now being done more efficiently with one less clerk.

In September, 1923, Miss Emily G. Philpotts was appointed Social Service Worker on a half-time basis and has served efficiently for the past nine months.

The surgeon wishes to express his thanks to the nursing and clerical force of the hospital as well as to the staff, whose willingness and devotion to duty has made it possible to conduct the clinics in a satisfactory manner.

Respectfully submitted,

CHANNING C. SIMMONS,
Surgeon.

July 1, 1924.

REPORT OF THE PHYSICIAN
AND
DIRECTOR OF THE MEDICAL LABORATORY
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: The first year of the newly expanded Medical Service has seen the accomplishment and development of many new forms of routine and investigative work. It is hoped that as time passes, the activity of the past year will be looked upon as an initial effort at the hospital in the further development of progressive clinical investigation concerning cancer and its allied problems. Where formerly the total time given by the staff was relatively slight, it is now very considerable. The number of cases studied and cared for has been very materially increased, as has the routine, and yet it is believed that the patients have been more profitably studied and better cared for than heretofore has been practicable.

The results of short wave length roentgen-ray therapy in chronic leukemia have been consistently striking and the patients are more benefited than formerly with radium. Routine observations of various clinical states with a segregation of an increasing number of groups of cases have received the cooperative investigation of the staff. This will bring together information obtained over quite a period of time and may serve to increase knowledge regarding the diagnosis, symptomatology, etc.

The routine work of the laboratory has grown to a degree where a further increase will be somewhat difficult to handle with the present assignments of the staff. The routine work of observing the blood of those workers exposed to irradiations has been continued and each day blood examinations are made on those patients about to be irradiated.

Most of the routine blood work has been carried on by Miss Daland and Miss Weld. Their work is to be commended, for beside carrying on efficiently the somewhat tedious routine they have completed a prolonged study on the blood phosphorus in cancer, anemia, and leukemia, under Dr. Buckman's and Dr.

Minot's supervision. They have also continued further experiments concerning the influence of sera on plant growth and the life of paramoecia, and have aided in attempts to evaluate certain special tests referable to cancer.

The development of a pediatric division of the Medical Service by Dr. Buckman, Assistant Physician in charge of Pediatrics, is an innovation. In addition to developing this clinic he has surveyed in conjunction with his work at the Boston City Hospital certain groups of cases, aided in the study of routine data, and supervised a portion of the work.

Dr. Isaacs, full time Assistant Physician, has filled a most important position in this department. In addition to his own investigations he has helped Dr. Minot conduct and supervise the routine and investigative work. The studies that Dr. Isaacs has particularly undertaken depend upon his discovery of the identification of red corpuscles at a stage between gross immaturity and complete maturity. The behavior of these red cells following irradiation appears indicative of the amount of benefit the patient will derive later and may serve to indicate the character of the effect of irradiation. Besides much work of this type, he has studied the effect of prolonged exercise on the blood, undertaken other incompletd studies, and done a considerable amount of teaching.

Dr. R. G. Spurling completed his work at this hospital October 1st, 1923. His work with Dr. Minot concerned the effect of treatment by the short wave length roentgen-rays on the hemopoietic organs. A clear comprehension of the blood alterations was established that aids in determining rational therapy.

Dr. J. S. Lawrence served as a special worker during July and August. He helped Dr. Hitchcock, who completed his service as part time resident physician September 1st. Dr. Lawrence studied certain properties of serum and with Dr. Spurling conducted experiments on the effect of radium on leucocytes in an isolated portion of the body.

On September 1st, Dr. D. R. Higbee began his service as resident physician on a full-time basis. In addition to the increasing routine duties of his position he studied the effect of irradiation on the blood coagulation factors.

Dr. B. Brock took up the duties of resident physician

February 1st, thus overlapping the time of Dr. Higbee's departure by one month. Owing to illness Dr. Brock was obliged to stop work May 1st, and Dr. R. J. Reitzel has filled his position. In spite of Dr. Brock being unable to serve more than half of his appointed time he made some excellent and nearly complete observations on certain properties of immature red cells. This study has been continued by Dr. Isaacs. Dr. Brock with Dr. Isaacs made observations concerning some characters of lymphocytes and continued the routine studies on vital capacity.

Dr. Reitzel has commenced work upon the metabolism of cells, and during the summer Dr. A. E. Koehler is to be associated with this study.

Mr. H. E. Pearse of the third year class, during his spare time has worked on a problem concerning the permeability of blood cells. He is in the process of studying with Dr. Minot the blood picture in Hodgkins disease, and the frequency of leucopenia following therapeutic irradiation. Mr. Pearse has been enabled to do this work by a scholarship from the Proctor Fund. Since September Dr. J. Hitchcock, also aided by the Proctor Fund, has continued to make observations on the basal metabolism in leukemia.

The help obtained from the Proctor Fund is gratefully acknowledged; in addition to the scholarships just mentioned the fund has provided certain apparatus and secretarial assistance and is to aid in a similar fashion in the ensuing year.

Dr. Minot's work has consisted in supervision of the staff, the investigative problems and the care of patients. With Dr. Isaacs and Dr. Buckman he has made a rather extensive analysis concerning some 300 cases of leukemia and has published several communications. He acts as consultant to a clinic at the Massachusetts General Hospital for diseases of the types seen at the Huntington Hospital. This has resulted in a friendly and helpful cooperation between the two clinics.

Several papers have been published during the year, and others are in preparation.

On December 6, 1923, the Medical Service was invited to present some papers before the New York Academy of Medicine and Drs. Minot, Buckman and Isaacs each spoke on different phases of leukemia.

The teaching of medical students at the hospital assigned to the Department of Medicine is one of the new developments of the year. The service has also provided cases for clinics given by Dr. Minot at the Medical School and material for the course in clinical pathology.

It is to be expected that knowledge leading toward the cure of cancer and allied disorders may be advanced through the study of the biology of growth, cellular physiology and physical and chemical therapeutics. Problems in these fields can be studied by many investigations and though some advances may be made by relatively untrained clinical workers it would seem that the greatest progress would result from a team of selected experts. It would be ideal to have a biologist, chemotherapist and other specialists combined with clinicians working continuously together.

The promotion of research related to cancer can be fostered by increasing the affiliation of the hospital and its laboratories with the work of different departments of the University and allied hospitals aiming to develop gradually the combined interests of many and to disseminate better knowledge among students.

The hospital can serve a unique purpose in offering opportunity for students to learn what proper clinical investigation means. Such a procedure develops the best practising physicians and permits the early development of those men qualified to become advanced investigators. At present only a few students can be accommodated at the hospital. Several have requested opportunity to undertake investigative work next year in the limited time at their disposal not assigned to routine studies. Two have been promised a chance to do so.

A graduate student, Dr. John Cohen, has been granted opportunity to spend the greater part of his time, as assistant in Medicine, to study particularly cell metabolism in the ensuing year.

Mr. Pearse has been again granted a scholarship from the Proctor Fund and will continue his investigations in 1924-25. It is also anticipated that Dr. Hitchcock will continue his studies on basal metabolism.

In the ensuing year work now under way will be continued and new studies begun. The exact problems to be chosen are

not yet decided, they will pertain to cell growth and function and to the evaluation of tests concerning diagnosis and prognosis. Simpler clinical studies such as a comprehensive survey of the end results, and certain symptoms in Hodgkins disease also are anticipated.

Progress necessitates effort and often expansion of space and personnel rather than a great multiplicity of buildings or individuals. A group of wisely selected workers should be given ample space and opportunity for calm, deliberate, serious investigation. To offer the most desirable conditions for such an attack upon the cancer problem a very considerable amount of financial support may be effectively employed.

Respectfully submitted,

GEORGE R. MINOT.

July 1, 1924.

REPORT OF THE MATRON-SUPERINTENDENT
TO THE
DIRECTOR OF THE CANCER COMMISSION OF
HARVARD UNIVERSITY

DEAR SIR: The year 1923-24 has seen an increasing activity in all departments of the hospital.

The total number of in-patients admitted during the year was 1,239. Of these 70 percent paid less than \$21 per week, 15 percent paid \$21 or more per week, and 14 percent were treated free of charge.

There has been a definite increase in the amount of work in many of the departments. The X-ray department will soon require the services of another nurse. The clerical work increased to such an extent it was necessary to employ an expert stenographer who was placed in charge of the department and has arranged the work in a much more systematic manner. It has also been necessary to employ another laundress, as the work in that department has increased.

The usual amount of painting, plastering and minor repairs necessary to keep the building in good condition has been done. A large item of expense in the General House and Property Department was the building of new lockers for patients' clothing. There have never been adequate lockers for this purpose, and as the wards have been filled to capacity a greater part of the year, this became an imperative need.

The expense of the Care of Patients remains about the same as the preceding year. Although extra nurses have been employed, an effort has been made to employ well-trained attendants for floor duty, whenever possible, in place of graduate nurses, as much of the routine work can be done by them under supervision of graduate nurses, who are in charge of the wards and operating room.

There have been seventeen deaths in the hospital. Autopsies were performed on ten.

Five hundred and eighteen operations were performed during the year as follows:

OPERATIONS FOR 1923-1924

Carcinoma	
Breast	
Amputation and dissection of axilla	5
Buccal Cavity	
Cheek	
Curettage and radium treatment	1
Excision	7
Plastic operation	3
Jaw	
Excision and cauterization with or without radium treatment	8
Exploratory	1
Sequestrum	
Removal	2
Curettage	1
Resection and cauterization	1
Lip	
Excision	12
Excision and dissection of neck	1
Palate	
Excision	1
Tongue	
Excision	5
Tonsil	
Radium treatment	1
Female Generative Organs	
Cervix	
Curettage and radium treatment	151
Ether examination	1
Ovary	
Ovariectomy	1
Uterus	
Curettage and radium treatment	19
Vagina	
Examination and application of radium	6
Curettage	1
Vulva	
Vulvectomy with drainage	1
Radium treatment	14
Male Generative Organs	
Penis	
Circumcision and excision	1
Circumcision and radium treatment	1
Prostate	
Cystoscopy	3
Peritoneum, Intestines and Rectum	
Esophagus	
Esophagoscopy and radium treatment	17
Gastrostomy	1
Hypopharynx	
Tracheotomy	1
Nasopharynx	
Curettage and radium treatment	1
Pharynx	
Radium treatment	2
Liver	
Exploratory laparotomy	2
Rectum	
Curettage and radium treatment	1

Larynx	
Laryngoscopy and radium treatment.....	18
Tracheotomy.....	20
Urinary Organs	
Bladder	
Cystoscopy.....	7
Urethra	
Cystoscopy.....	2
Cystoscopy and radium treatment.....	1
Regions not Elsewhere Mentioned	
Axilla	
Excision.....	1
Antrum	
Excision and radium treatment.....	1
Branchial Cleft	
Incision and drainage, broken down.....	2
Bronchoscopy and radium treatment.....	2
Skin	
Excision.....	36
Adamantinoma	
Jaw	
Excision and radium treatment.....	1
Hemangio-endothelioma	
Shoulder	
Excision.....	1
Sarcoma	
Antrum	
Radium treatment.....	1
Hand	
Excision.....	1
Palate	
Radium treatment.....	3
Sinuses and orbit	
Excision.....	1
Fibrosarcoma	
Hip	
Excision.....	1
Melanotic sarcoma	
Skin excision.....	4
Epulis	
Excision.....	1
Lymphosarcoma	
Tonsil	
Tracheotomy.....	1
Non-Malignant Tumors	
Angioma	
Lip	
Excision.....	1
Cyst	
Thyro-glossal	
Excision.....	1
Cystitis, alcoholic	
Suprapubic cystostomy.....	1
Cystic disease	
Breast	
Excision.....	1

Fibroma	
Skin	
Excision.....	4
Fibromyoma	
Uterus	
Curettage and radium treatment.....	13
Keloid	
Excision.....	3
Mixed malignant tumor	
Parotid	
Excision.....	1
Neuralgia	
Alcohol injection.....	1
Osteo-fibroma	
Alveolar process	
Excision and cauterization.....	2
Papilloma	
Skin	
Excision.....	3
Larynx	
Laryngoscopy and radium treatment.....	2
Excision.....	1
Lip	
Excision.....	1
Nose	
Excision.....	1
Tongue	
Excision.....	1
Palate	
Excision.....	1
Vagina	
Curettage and radium treatment.....	1
Polyp	
Cervix	
Excision.....	2
Uterus	
Curettage and radium treatment	3
Rhinolith	
Nose	
Excision.....	1
Wen	
Excision.....	5
Special Skin Diseases	
Keratosis	
Lip	
Excision.....	4
Nevus	
Excision.....	5
Verruca	
Hand	
Excision.....	1
Lip	
Excision.....	1
Neck	
Excision.....	1
Scalp	
Excision.....	1
Cicatrix	
Excision.....	5

Comedus	
Excision.....	I
Sarcoid	
Nose	
Excision.....	I
Other Conditions	
Abscess	
Incision and drainage	4
Endocervicitis	
Dilatation and curettage.....	2
Curettage and radium treatment.....	I
Endometritis, hyperplastic	
Curettage and radium treatment.....	3
Fistula	
Vagina	
Repair.....	I
Erosion	
Cervix uteri	
Curettage and radium treatment.....	2
Trachelorrhaphy.....	I
Ethmoiditis	
Intransal exenteration.....	I
Granulating wound	
Skin grafting.....	7
Bronchoscopy	
Removal foreign body.....	I
Hemorrhage	
Ligation of artery.....	I
For diagnosis	
Removal of specimen.....	3I
Leukoplakia	
Tongue	
Cauterization.....	I
Lupus, vulgaris	
Nose	
Curettage.....	I
Stricture	
Esophagus	
Dilatation.....	I
Transfusion.....	2
Ulcer	
Skin	
Excision.....	I
Tongue	
Excision.....	2
Tonsillitis	
Tonsillectomy.....	2
Caruncle	
Urethra	
Excision.....	I
Radium treatment.....	I
Appendicitis	
Appendectomy.....	I
Incontinence	
Cystoscopy.....	I
Specific Infectious Diseases	
Tuberculosis	
Soft palate	
Radium treatment.....	I

The chief physical needs of the hospital at present are as follows:

1. A new roof over Ward B solarium.
2. A sitting room for Ward B patients.
3. Repainting the walls in the private rooms.
4. Refinishing the floors in the nurses' quarters.

Many distinguished visitors from foreign countries and representatives from various societies have visited the hospital during the year and have attended the clinics. The Radium Society of Boston and the Massachusetts State League of Nursing Education have held their meetings here during the winter of 1923-24.

The intensive follow-up work has continued under the direction of Miss Myra Conover, the assistant Matron-Superintendent, and the excellent results are due to her efforts.

We are indebted to the following friends for gifts:

Dr. R. B. Greenough.....	Money for Christmas.
Dr. C. C. Simmons.....	Books and magazines.
Dr. Wm. M. Shedden.....	Books and records for the gramophone.
Mrs. Moses Williams.....	Flowers.
Mr. R. C. Thorpe.....	Flowers.

Respectfully submitted,

ANNA L. GIBSON, R.N.

July 1, 1924.

REPORT OF THE SOCIAL SERVICE WORKER
TO THE
DIRECTOR OF THE CANCER COMMISSION
OF HARVARD UNIVERSITY

DEAR SIR: The following is the report of the part-time social worker from October 1, 1923, when, after a lapse of some months, social service was re-established at the Huntington Hospital, to July 1, 1924.

Patients were referred to the Department by members of the Staff, the Superintendent, Assistant Superintendent and outside agencies. The social problems consisted of financial difficulty, following up patients medically in the home, friendly visits, placing patients for permanent hospital care, and in a few instances unemployment.

During this time 124 patients were referred to the Department — 92 home visits were made, 15 patients were placed in hospitals for permanent care, vacations were arranged for 3, and 11 were referred to the District Nursing Association.

A balance of \$444.90 that remained from the gift appropriated last year by the Committee of the Permanent Charity Fund Incorporated has been most useful for the relief of patients. For example; a patient had been advised to have an operation that necessitated a two weeks' stay in the hospital. The family consisted of her husband, five children and an invalid relative. The husband earned a salary inadequate to meet the extra expense that sickness incurs. The case was referred to the Family Welfare Society with whose aid and cooperation a housekeeper was employed, thus not only making it possible for the patient to come to the hospital for the operation, but giving her the feeling that her family was being taken care of during this period.

Another instance is that of a man, aged 71, who after operation was advised frequent return to the hospital for treatment. He was homeless and destitute. With the cooperation of two other agencies and an interested individual, besides the financial assistance of our social service, we were able to secure board and

lodgings in the immediate neighborhood for this patient, enabling him, for many months, to derive the benefit from the treatments at the hospital until it became necessary to place him in a hospital for permanent care.

Other worthy patients have received various kinds of supplies for their comfort.

The Department appreciates the cooperation of members of the Staff, the Superintendent and Assistant Superintendent, and great credit must be awarded the Red Cross Motor Corps who have been unfailing in their efforts to arrange transportation to and from the hospital by automobile for patients who are too ill to come otherwise.

Respectfully submitted,

EMILY G. PHILPOTTS,
Social Worker.

REPORT OF THE
RESEARCH FELLOW IN PHYSICS
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

DEAR SIRs: I have the honor of presenting the following report:

In addition to our regular work of providing emanation applicators for the radium treatments, we have developed an automatic device for running the pumps in the emanation plant. A clock has been constructed and set up which automatically makes and breaks the current that drives the auxiliary oil pump once each hour. The stop cocks in the emanation plant are opened in such a way that the oil pump operates the mercury pump nearest to the bulb containing the radium solution. This mercury pump, therefore, functions once each hour during the day and night and pumps the emanation and hydrogen and oxygen gases that have accumulated during the previous hour from the solution bulb into the purifying chambers. The current of electricity that passes through the oxide covered copper wire in the purifying tubes flows all the time, and this purifies the emanation as it comes over from the radium solution. In this way, the entire amount of emanation available is in a purified state and ready to be drawn off at practically any time of day desired. A second clock also has been constructed and set up, which, on throwing a switch, operates the second mercury pump in the emanation plant. The second clock is so designed as to cause the second mercury pump to operate once every three minutes, and by this means, the purified emanation is pumped over into the glass tubes used in the therapeutic applications.

The automatic regulation of the emanation plant materially reduces the time required by the operator to work the pumps. This has proved to be of great advantage not only on account of the reduction in the amount of labor, but also because the operator remains near the emanation plant a much shorter time.

The short wave length X-ray plant has been functioning in a purely routine manner and we are now giving treatments at the rate of four to six a day.

A new X-ray plant, of commercial design, has been purchased and installed for diagnostic purposes and also for treatments of diseases requiring X-rays produced by low voltages. This new plant is now being operated by competent X-ray experts and the necessary assistants.

The Department of Bio-Physics has been carrying on research and has published several articles on the measurement of X-ray dosage, etc.

It has also been carrying on researches with the aid of several National Research Fellows on the physics of secondary and tertiary radiation. The phenomena of secondary and tertiary radiation have important bearings on the distribution of X-radiation throughout the human body during the treatments and also upon the photographic imprints produced by X-rays in diagnosis.

The department is now cooperating with the Safety Committee of the Roentgen Ray Society in an endeavor to formulate rules and regulations to be followed by X-ray experts in planning their X-ray plants. We are also endeavoring to design a small portable instrument to be used in testing the various points in an X-ray laboratory usually occupied by the operators, to determine the intensity of radiation to which they are more or less continuously subjected.

During the past year, the American Roentgen Ray Society has awarded us the first Leonard prize of \$500 for researches in X-radiation.

Respectfully submitted,

WILLIAM DUANE,
Research Fellow in Physics.

July 1, 1924.

REPORT OF THE
RESEARCH FELLOW IN BIO-PHYSICS
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I have the honor of presenting the following report of the activities of my laboratory during the past year.

As in the preceding years, instruction in Bio-physics has demanded a great deal of my time and attention. I have conducted four courses in the Physics Department which are listed in the catalog as follows:

- Physics 21 —Elementary Biophysics
- “ 21 —Physics of the Special Sense Organs
- “ 23 —Special Research Problems
- 20K—Advanced Research Problems.

I have also offered two courses in Bio-physics in the Medical School.

MEDICAL SCHOOL COURSES — In the courses offered in the Medical School emphasis is laid on the application of various physical methods in diagnosis.

In addition to regular courses in Bio-physics I have given a series of lectures to students in the School of Tropical Medicine and have addressed several learned societies — a partial list of those addressed is as follows:

Insert 8 pt—

- Franklin Institute of Pennsylvania,
- Philosophical Society of Pennsylvania,
- Harvey Society of New York,
- American Chemical Society Symposiums
- Milwaukee meeting,
- Washington meeting,
- Riverbank Laboratories Research Club,
- Physical Colloquim—Harvard University,
- Mt. Holyoke College Research Club,
- Smith College Research Club,
- American Association of Obstetricians,
- Gynecologists and Abdominal
- Surgeons,
- American Association of Cancer Research,
- Various Medical Societies.

The interest in Bio-physics has become very widespread indeed. The subject matter, however, has never been collected

and correlated in one place. Because of the pressure of many requests for text books in Bio-physics which have come to me I am going to endeavor during the next few months to so arrange my time and activities that I can write a book on the subject.

Dr. Wallace Craig, our Librarian, has completed the translation of "Grundzuge der Lichtbiologie und Lichtpathologie" by Prof. Dr. Walther Hausmann. A voluntary class composed of students in my courses, their friends, people engaged in research, doctors and nurses connected with the hospital, etc., meet on Thursday evenings for the purpose of discussing and putting this translation in final form for publication. A very keen interest has been evinced by all who are attending and we hope to have the work completed in a short time.

Through Mr. M. Douglas Flattery, a Committee on Medical Research of the Boston Conservation Bureau was formed. This Committee has been organized to prosecute experiments in which the usefulness of established clinical methods can be determined and to investigate certain diseases which are not at present receiving the attention which their seriousness demands.

The General Electric Company have recently perfected improved methods for making ultra violet lamps. With their co-operation we are undertaking an investigation to determine the value of these lamps for therapeutic purposes.

The following research problems have been or are being conducted in my laboratory:

MR. O. C. WOOLPERT — Has completed the work on photochemical changes in proteins produced by ultra-violet light and three papers describing his results are now in process of publication. The first paper describes experiments on the effects of radiation on solutions of albumen. The solutions were adjusted to various H concentrations, were exposed to a powerful mercury vapor arc and the effect of the hydrogen ion concentration on the heat coagulability of the radiated solutions determined. It was found that the hydrogen ion zone of heat coagulation is greatly constricted by radiation. The constriction proceeds, it seems only from the alkaline side. These results are not in accordance with results previously published by other investigators.

As a result of these experiments, it was concluded that a radiated albumen solution contains not only molecules which

will coagulate at 15° but other molecules which require higher temperatures to produce coagulation.

PROF. C. E. BARR — Has continued his work on the reactions of living organisms under ultra-violet radiation. Upon exposing amoebas to this radiation he has found that cytolysis of the cell began in 94% of the cases at or in the immediate vicinity of the youngest pseudopod — that is in the most dynamic physiologically active or dominant part of the cell. This links up the effect of ultra-violet radiation with the results obtained by Child, Hyman and others through the use of poisons and narcotics.

In another series of experiments he found that the absorption of ultra-violet light demonstrably reversed the polarity or the seat of dominance in the cell. When the tip of the advancing pseudopod of an amoeba entered a field of ultra-violet radiation a reversal of dominance occurred that was found to be much more certain and precise than had been observed by previous experimenters who had employed visual light.

Perhaps the most significant of all his experiments, however, concerned the phenomena that followed on cytolizing the posterior tip of an amoeba with ultra-violet light. The cytolized material acted like a poison, for when it was drawn into the stream of flowing endoplasm and disseminated through the cell the activities of the cell were almost completely inhibited and death and disorganization of the protoplasm followed.

MR. WALTER S. HUGHES — Has continued his studies on Interfacial Potentials and has assisted in the laboratory instruction of the various courses offered by the Department.

DR. E. L. CHAFFEE — Cooperating with me in an investigation on the Electrical Response of the Optic Nerve.

The experiments were conducted with substantially the same apparatus as was used in the previous experiments with white light, except for the addition of a monochromatic illuminator of very close selectivity, covering the entire visible range of wave lengths and capable of accurate intensity adjustment.

The results of the experiment prove conclusively that the shape of the electrical response curve from the retina is not dependent upon the color of the stimulating light though the magnitude of the response does change with color due to the variation of sensitivity of the eye for various colors. The wave

length of maximum sensitivity shifts toward the red with increasing intensity.

A paper describing these experiments is now in press.

MR. PAUL RUPERT GAST — The work on photoelectric phenomena in relation to forest growth has been continued. This work has been conducted in conjunction with the Forestry Department under the same conditions as last year.

With the cooperation of Professor Fisher we are raising funds for the erection of a laboratory — part of which will have greenhouse construction. This laboratory will be used for the forestry experiments as well as for the general work of Biophysics.

MR. PERCY K. JULIAN — Chemical changes in the interfaces of heterogeneous materials.

A list of the papers published during the year will be found in the list of Publications of the Cancer Commission.

Respectfully submitted,

W. T. BOVIE.

July 1, 1924.

REPORT OF THE
RESEARCH FELLOW IN BIO-CHEMISTRY
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: During the past year the work of the department has been carried on by my assistant, Mrs. M. L. Pearse.

She has continued her investigations on the nitrogen metabolism of cancer patients and of normal individuals. In confirmation of Salkowski's work she finds a distinct increase in undetermined nitrogen in the urine of cancer patients. Studies upon the metabolism of urea, uric acid, ammonia, amino-acids, and creatinin show no marked deviation from the normal. The increase in undetermined nitrogen is not affected by the activities of the individual or by irradiation.

Investigation of the physico-chemical changes of the blood of cancer patients and studies in phenol metabolism are being planned for the coming year.

Respectfully submitted,

HENRY LYMAN, M.D.

July 1, 1924.

REPORT OF THE STATE DIAGNOSIS SERVICE FOR THE YEAR ENDING JUNE 30, 1924

The number of specimens received for examination and diagnosis during the year ending June 30, 1924, was 2,220. Of this number, 628 came from the Huntington Hospital, and 1,592 from outside. These figures are increases of 17 and 48 respectively, over the corresponding figures for the preceeding year.

Of the 1,592 specimens from outside, a large proportion were marked as originating in certain hospitals, but others undoubtedly came from operations in hospitals without this being indicated. Also, many specimens came from hospitals without indicating the surgeon's name. For these reasons the data given below are necessarily approximate.

The hospitals from which specimens were marked as originating, other than the Huntington Hospital, are as follows:

- Addison Gilbert Hospital, Gloucester
- Beverly Hospital
- Brigham, Robert, Boston
- Brockton Hospital
- Brooks Hospital, Boston
- Burbank Hospital, Fitchburg
- Cable Hospital, Ipswich
- Cape Cod Hospital, Hyannis
- Clinton Hospital
- Cooley Dickinson Hospital, Northampton
- Crary Hospital, North Dartmouth
- Elliott Hospital, Boston
- Fairlawn Hospital, Worcester
- Fairview Hospital, Great Barrington
- Fall River General Hospital
- Free Hospital for Women, Boston
- Gale Hospital, Haverhill
- Groton Hospital
- Harvard Dental School, Boston
- Henry Heywood Hospital, Gardner
- Hillcrest Hospital, Pittsfield
- Holyoke City Hospital
- House of Providence Hospital, Holyoke
- Leominster Hospital
- Leonard Morse Hospital, Natick
- Lynn Hospital
- Malden Hospital
- Massachusetts Woman's Hospital, Boston
- Middlesex Hospital, Cambridge

Moore Hospital, New Bedford
 Morton Hospital, Taunton
 Newburyport Homeopathic Hospital
 New England Sanitarium, Melrose
 Newton Hospital
 Peabody Hospital
 Plunkett Memorial Hospital, Adams
 Quincy City Hospital
 Sacred Heart Hospital, Manchester
 Salem Hospital
 Somerville Hospital
 State Infirmary, Tewksbury
 St. John's Hospital, Lowell
 St. Luke's Hospital, New Bedford
 Sturdy Memorial Hospital, Attleboro
 Summit Hospital
 Symmes Hospital, Arlington
 Taunton State Hospital
 Thomas, J. B. Hospital, Peabody
 Waltham Hospital
 Whidden Hospital, Everett

The number of surgeons or other persons whose names were given as senders of specimens, exclusive of specimens from the Huntington Hospital, is 367, which is an increase of 53 over the number for the preceeding year.

The great majority of the senders of specimens are located outside of Boston and adjoining towns. From this it would seem that the facilities of the Diagnosis Service for the microscopical examination of surgical material reach communities which it is especially desirable to serve.

The process of embedding tissue in paraffin for the preparation of our microscopical sections has been improved during the year. In this process the tissue is immersed for certain periods in several fluids in succession. To preserve the identity and prevent confusion of specimens, it was necessary that each specimen be treated by itself in separate fluids and bottles. The considerable number of specimens put through each day required a large number of bottles, much manipulation, and considerable time. The improvement consists in greatly reducing this required time and manipulation, by attaching the identifying label to each specimen before it is started in the embedding process, so that any desired number of specimens can be immersed together in one of the fluids in one container without confusion of the identity of any specimen. Thus a number of specimens may be transferred, with their labels attached, from one fluid to another almost as quickly as a single specimen can

be. The attachment of the label to the specimen is effected by means of a small piece of copper wire gauze folded over the latter, and secured by a small wire "clip," such as is used for holding sheets of paper together.

Respectfully submitted,

J. HOMER WRIGHT, M.D., D. Sc.,
Pathologist in charge of Free Diagnosis Service.

REPORT OF THE TREASURER

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I have the honor to submit to you my report for the year ending June 30, 1924.

Contributions to the funds of the Cancer Commission have been received by the Treasurer of Harvard College between July 1, 1923, and June 30, 1924, amounting to \$146,863.70. Of this amount \$41,284.90 was used for current expenses and \$105,578.89 was added to the invested funds.

\$5,000.00 given in 1922-1923 for X-ray equipment and \$9,688.84 for 1923-1924 deficit were charged to the hospital endowment fund. The net increase in the funds of the Commission during the year was \$91,051.91.

The Treasurer of Harvard College on July 1, 1924, held the following funds for the benefit of the Cancer Commission of Harvard University:

EXHIBIT A

Lawrence Carteret Fenno Fund — Treatment by Light Rays....	\$20,000.00
Emily J. Proctor Gift.....	3,215.98
Memorial Cancer Hospital Endowment Fund.....	103,059.40
Memorial Cancer Hospital Endowment Fund (New).....	500.00
Francis Bartlett Free Bed Fund.....	5,000.00
T. Jefferson Coolidge Fund for Cancer Research.....	2,000.00
Caroline Brewer Croft Fund.....	92,025.00
William Endicott Fund.....	25,000.00
Dudley B. Fay Memorial.....	2,000.00
Lawrence Carteret Fenno — Free Bed Fund.....	5,000.00
Charles S. Fairchild.....	5,000.00
Albert Geiger.....	2,078.89
Franklin H. Hooper Free Bed Fund.....	5,000.00
Amos Lawrence Hopkins Free Bed Fund.....	5,000.00
Marion D. Lockwood Memorial.....	50,728.58
James Ewing Mears Bequest.....	9,295.01
George Von L. Meyer Bequest.....	2,500.00
Clara Endicott Payson Free Bed Fund.....	5,000.00
Elizabeth Worcester Mills.....	203,500.00
Henry O. Underwood.....	10,000.00
Julia M. Moseley Fund.....	23,250.00
F. D. Moulton Gift for Social Workers.....	400.21
Gifts for Research in Genetics.....	320.00
	\$579,873.07

This amount is to be compared with the total of \$489,821.16 in last year's report.

The list of subscribers to the Cancer Commission of Harvard University in 1923-1924 is as follows:

GIFTS FOR CAPITAL

Albert G. Geiger, Estate of	\$2,078.89	
His bequest plus accrued interest "to be used both principal and interest as corporation shall deem most expedient for the benefit and maintenance of the Collis P. Huntington Memorial Hospital."		
"Elizabeth Worcester Mills Fund"		
Hiram F. Mills, Estate of		
Additional	103,500.00	
		\$105,578.89

GIFTS FOR IMMEDIATE USE

"A Friend"	\$1,980.00	
Salaries:		
Anonymous	\$1,000.00	
Anonymous	4,500.00	
		5,500.00
Appropriation by State of Massachusetts for support of Free Diagnosis Service	2,500.00	
Current Expenses:		
George R. Agassiz	250.00	
Rodolphe L. Agassiz	25.00	
Karl Adams	10.00	
Mrs. Leonard D. Ahl	50.00	
Edward B. Alford	25.00	
Miss Martha A. Alford	100.00	
Mrs. Charles Almy	10.00	
John S. Ames	50.00	
Mrs. Charles W. Amory	500.00	
Anonymous	50.00	
Edmund K. Arnold	15.00	
Charles F. Ayer	50.00	
Frederick Ayer	25.00	
Roger W. Babson	25.00	
Miss Ellen S. Bacon	50.00	
Louis Baer	10.00	
Clarence W. Barron	25.00	
Mrs. John W. Bartol	10.00	
Mrs. Walter C. Baylies	500.00	
Mrs. Junius Beebe	10.00	
Frank B. Bemis	100.00	
William Sturgis Bigelow	300.00	
Charles S. Bird	25.00	
George Nixon Black	100.00	
Mrs. Arthur W. Blake	20.00	
Mrs. Francis Blake	50.00	
Mrs. J. A. Lowell Blake	100.00	
Carried forward	\$2,485.00	

<i>Brought forward</i>	\$2,485.00
Elmer J. Bliss	25.00
Daniel M. Bonney and Mrs. Bonney	100.00
Mrs. Frederick T. Bradbury	1,500.00
Henry G. Bradlee	100.00
Mrs. Edward D. Brandegee	100.00
Miss Sarah F. Bremer	50.00
Miss Florence N. Bridgman	25.00
Gorham Brooks	100.00
Mrs. Shepherd Brooks	50.00
Mrs. John A. Burnham	10.00
Allston Burr and Mrs. Burr	25.00
I. Tucker Burr	50.00
Mrs. Arthur Tracy Cabot	250.00
Godfrey L. Cabot	100.00
Henry B. Cabot	25.00
Samuel Cabot and Mrs. Cabot	25.00
Walter M. Cabot	5.00
Miss Georgina S. Cary	25.00
Miss Louise W. Case	50.00
Miss Marian Roby Case	25.00
Mrs. Henry B. Chapin	10.00
Mrs. Theodore Chase	25.00
Hermann F. Clarke	10.00
Mrs. Charles K. Cobb	25.00
Committee of the Permanent Charity Fund Incorporated	1,000.00
Mrs. Costello C. Converse	500.00
Harold J. Coolidge	50.00
Mrs. T. Jefferson Coolidge	1,000.00
Mrs. Charles E. Cotting	100.00
Miss Elizabeth A. Cotton	200.00
Mrs. Alvah T. Crocker	100.00
Edward C. Crossett	100.00
Charles P. Curtis	100.00
John S. Curtis	50.00
Richard H. Dana	10.00
Ernest B. Dane and Mrs. Dane	100.00
John Dane and Mrs. Dane	10.00
Philip Y. De Normandie	25.00
Robert L. De Normandie and Mrs. De Nor- mandie	25.00
J. Robertson Duff	25.00
Mrs. Frank E. Dunbar	100.00
Miss Hannah M. Edwards	50.00
Julius Eiseman	10.00
Mrs. Hamilton Emmons	250.00
Nathaniel H. Emmons	100.00
Mrs. Robert W. Emmons, 2d	100.00
Richard M. Everett	5.00
Herbert E. Fales	25.00
Charles A. Falvey	10.00
John W. Farlow	25.00
Miss Fannie M. Faulkner	25.00
Mrs. Henry H. Fay	25.00
Samuel M. Felton, 3d	25.00
Sewall H. Fessenden	50.00
Frederick P. Fish	25.00
<i>Carried forward</i>	\$9,415.00

<i>Brought forward</i>	\$9,415.00
Mrs. Richard T. Fisher	100.00
Mrs. W. Scott Fitz	25.00
Desmond FitzGerald	5.00
Frederick C. Fletcher	100.00
Mrs. Waldo E. Forbes	50.00
Thomas A. Forsyth	25.00
Lee M. Friedman	25.00
Mrs. Louis A. Frothingham	100.00
Mrs. Alvan T. Fuller	25.00
Homer Gage	50.00
William F. Garcelon	10.00
Mrs. William Tudor Gardiner	25.00
Morris Gray	20.00
Mrs. Reginald Gray	25.00
Malcolm S. Greenough	25.00
Edward W. Grew	25.00
Lawrence Grinnell	25.00
Frank W. Hallowell	25.00
N. Penrose Hallowell and Mrs. Hallowell	25.00
Paul M. Hamlen	10.00
Francis R. Hart	50.00
Winthrop A. Harvey	100.00
Miss Ellen R. Hathaway	100.00
Horatio Hathaway, Jr.	25.00
Augustus Hemenway	50.00
Robert F. Herrick and Mrs. Herrick	200.00
Charles Higginson	10.00
Donald M. Hill	10.00
Conrad Hobbs	10.00
Franklin W. Hobbs	25.00
Miss Fredrika G. Holden	5,000.00
Amor Hollingsworth	25.00
Zachary T. Hollingsworth	50.00
Mrs. Edward J. Holmes	10.00
The Misses Holt	50.00
Robert Homans	25.00
William P. Homans	100.00
William Hooper	50.00
Henry Hornblower	100.00
Ralph Hornblower	10.00
Clement S. Houghton	50.00
Miss Elizabeth G. Houghton	25.00
Henry S. Howe	100.00
Mrs. Charles W. Hubbard	25.00
The Humane Society of the Commonwealth of Massachusetts	500.00
Henry S. Hunnewell	500.00
James M. Hunnewell	50.00
Harry H. Hunt	25.00
Mrs. Oscar Iasigi	50.00
Mrs. Henderson Inches	10.00
Charles C. Jackson	100.00
Henry Jackson	10.00
James Jackson	25.00
Arthur S. Johnson	25.00
Edward C. Johnson	25.00
Mrs. Benjamin M. Jones	30.00
<i>Carried forward</i>	\$17,685.00

<i>Brought forward</i>	\$17,685.00
Mrs. Edward L. Kent	25.00
Nathaniel T. Kidder	100.00
David P. Kimball	50.00
The Misses Kimball	50.00
The Misses King	25.00
Mrs. Henry Parsons King	200.00
Louis E. Kirstein	50.00
Mrs. Shepard Krech	25.00
Horatio A. Lamb	25.00
Thomas W. Lamont	250.00
Mrs. Gardiner M. Lane	1,000.00
Mrs. Amory A. Lawrence	50.00
Lawrence Model Lodging Houses	400.00
George C. Lee and Sons, in memory of Elizabeth Winsor	100.00
Joseph Lee	1,000.00
Amory Leland	100.00
Dudley R. Leland	100.00
Mrs. David M. Little	20.00
Henry Cabot Lodge	10.00
Mrs. Augustus P. Loring	25.00
Augustus P. Loring, Jr.	10.00
Mrs. Lindsley B. Loring	10.00
William Caleb Loring	10.00
Mrs. Thornton K. Lothrop	50.00
Miss Mabel Lyman	100.00
James MacNaughton	500.00
James W. Maguire	10.00
Edward Mallinckrodt, Jr.	500.00
Mrs. George S. Mandell	20.00
Austin B. Mason	5.00
Mrs. Charles E. Mason	700.00
Miss Fanny P. Mason	25.00
Miss Ida M. Mason	50.00
James H. Means	25.00
Mrs. Daniel Merriman	25.00
J. Pierpont Morgan	100.00
George B. Morison	10.00
Miss Frances R. Morse	25.00
Mrs. E. Preble Motley	100.00
Mrs. J. Lothrop Motley	5.00
Mrs. Otis Norcross	100.00
George R. Nutter	10.00
Patrick A. O'Connell	25.00
William O'Connell	20.00
Frank C. Paine	100.00
Robert Treat Paine	25.00
Mrs. Robert Treat Paine, 2d	25.00
William A. Paine	500.00
Augustin H. Parker	10.00
Miss Eleanor S. Parker	100.00
Miss Amelia Peabody	25.00
George A. Peabody	500.00
Mrs. John E. Peabody	20.00
Mrs. W. Rodman Peabody	10.00
James J. Phelan and Mrs. Phelan	50.00
Mrs. George Philler	15.00
<i>Carried forward</i>	\$25,105.00

<i>Brought forward</i>	\$25,105.00
Dudley L. Pickman	50.00
Walworth Pierce	25.00
John R. Post	10.00
Miss Julia C. Prendergast	25.00
Mrs. Francis M. Rackemann	100.00
Mrs. Neal Rantoul	100.00
Miss Barbara M. Reynolds	50.00
Harrison G. Reynolds	50.00
James R. Reynolds, Jr.	50.00
Mrs. Nehemiah W. Rice	100.00
Charles O. Richardson	25.00
Mrs. John Richardson, Jr.	15.00
Mrs. John C. Richardson	25.00
William K. Richardson	10.00
William L. Richardson	100.00
Charles E. Riley	50.00
In memory of Mrs. F. Ripley	500.00
Russell Robb	50.00
Miss Emma Rodman	25.00
Bernard J. Rothwell	25.00
John L. Saltonstall	100.00
Mrs. Richard M. Saltonstall	100.00
Robert Saltonstall	100.00
Sabin P. Sanger	50.00
Mrs. Francis W. Sargent	125.00
Henry B. Sawyer and Mrs. Sawyer	25.00
Miss Eleonora R. Sears	15.00
Herbert M. Sears	100.00
Mrs. J. Montgomery Sears	100.00
Mrs. Knyvet W. Sears	200.00
Richard D. Sears	100.00
Mrs. Quincy A. Shaw	200.00
Mrs. Quincy A. Shaw, Jr.	500.00
William L. Shearer	50.00
Mrs. George S. Silsbee	50.00
William Simes and Mrs. Simes	50.00
Miss Laura Slocum	10.00
John T. Spaulding	100.00
William S. Spaulding	100.00
Robert H. Stevenson	50.00
James A. Stillman	100.00
Philip Stockton	50.00
Galen L. Stone	500.00
Malcolm B. Stone and Mrs. Stone	15.00
Nathaniel H. Stone	100.00
Robert W. Storer	25.00
Theophilus B. Stork and Mrs. Stork	100.00
Charles E. Stratton	10.00
Mrs. Thomas Russell Sullivan	5.00
Joseph S. Sylvester and Mrs. Sylvester	25.00
Miss Alice P. Tapley	100.00
Mrs. Ezra R. Thayer	10.00
John E. Thayer	100.00
Mrs. Nathaniel Thayer	100.00
Mrs. Washington B. Thomas	25.00
Albert Thorndike	25.00
Mrs. Arthur R. Tirrell	25.00
<i>Carried forward</i>	\$29,930.00

<i>Brought forward</i>	\$29,930.00	
"The Eugene Tompkins Memorial"	1,000.00	
W. Howard Townsend	50.00	
Charles H. Traiser	25.00	
Mrs. Alexander F. Wadsworth	15.00	
Eliot Wadsworth	100.00	
Charles C. Walker	50.00	
Mrs. Bayard Warren	100.00	
J. Collins Warren	100.00	
Lucius H. Warren	50.00	
Frank G. Webster and Mrs. Webster	200.00	
Charles F. Weed	15.00	
Warren B. P. Weeks	25.00	
Mrs. Charles G. Weld	500.00	
Mrs. C. Minot Weld	25.00	
Miss Mary Weld	500.00	
Welfare Fund, through George F. Larcom, Trustee	100.00	
William P. Wharton	100.00	
Edward C. Wheeler, Jr.	25.00	
Miss Gertrude R. White	25.00	
Mrs. William Whitman, Jr.	100.00	
Edward F. Whitney	200.00	
Edward Wigglesworth	25.00	
George Wigglesworth	50.00	
Hugh Williams	50.00	
Mrs. Jeremiah Williams	100.00	
Mrs. Roger Wolcott	25.00	
Mrs. William M. Wood	25.00	
Henry D. Woods	200.00	
		\$33,710.00
Grant from the Medical School for work in the laboratory of the Cancer Commission of the Flattery Research Fund		\$750.00

The balance sheet for June 30, 1924, is as follows:

EXHIBIT B			
<i>Assets</i>		<i>Liabilities</i>	
Cash	\$140.00	Accounts Payable	\$1,133.58
Accounts Receivable	18,864.04	Reserve for Doubtful Ac- counts	10,394.01
Inventories:		Fund and Gifts (Exhibit A)	579,873.07
Food	\$104.23	Advanced by the Uni- versity	8,170.81
Medical and Surgical Sup- plies	590.13		
	694.36		
Investments in hands of Treasurer of Harvard University	579,873.07		
	<u>\$599,571.47</u>		<u>\$599,571.47</u>

The statement of income and expense for the year ended June 30, 1924, as supplied by the Bursar's Office of Harvard University is as follows:

EXHIBIT C

[illegible]

*Includes Reserve for doubtful accounts and corrected accounts charged off = \$5,512.78.

**\$5,000.00 of this item was used for equipment.

*Carried from 1923-1924 in endowment fund.

Respectfully submitted,

(Signed) CHARLES JACKSON,
Treasurer.

July 1, 1924.

LIST OF COMMUNICATIONS CANCER COMMISSION OF HARVARD UNIVERSITY

1. Statistics of Cancer — W. F. Whitney.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, p. 33.
October 23, 1900.
2. On the Etiology of Cancer — E. H. Nichols.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 34-58.
October 23, 1900.
3. Report of the Presence of "Plimmer's Bodies" in Carcinomatous Tissue
— R. B. Greenough.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 59-62.
October 23, 1900.
4. Tumors and Sporozoa of Fishes — E. E. Tyzzer.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 63-68.
October 23, 1900.
5. The Reconstruction of a Nodule of Cancer — E. A. Locke.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 69-71.
October 23, 1900.
6. Report of Culture Experiments made with Carcinomatous Tissue, 1889-
1900 — Oscar Richardson.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 72-80.
October 23, 1900.
7. Coccidium Infection of the Rabbit's Liver — E. E. Tyzzer.
Journal of Medical Research, Vol. 7, No. 3, pp. 235-254. April, 1902.
8. Molluscum Contagiosum — Charles J. White and W. H. Robey, Jr.
Journal of Medical Research, Vol. 7, No. 3, pp. 255-277. April, 1902.
9. Culture Experiments with Malignant Tumors — Oscar Richardson.
Journal of Medical Research, Vol. 7, No. 3, pp. 278-279. April, 1902.
10. Four Pathogenic *Torulæ* (Blastomycetes) — Joseph D. Weis.
Journal of Medical Research, Vol. 7, No. 3, pp. 280-311. April, 1902.
11. The Relation of Blastomycetes to Cancer — E. H. Nichols.
Journal of Medical Research, Vol. 7, No. 3, pp. 312-359. April, 1902.
12. Cell Inclusions in Cancer and in Non-cancerous Tissue — R. B. Greenough.
Journal of Medical Research, Vol. 7, No. 3, pp. 360-380. April, 1902.
13. A Contribution to the Classification of Tumors — F. B. Mallory.
Journal of Medical Research, Vol. 13, No. 2, pp. 113-136. January,
1905.
14. On the Nature of the Cell Inclusions of Cancer — R. B. Greenough.
Journal of Medical Research, Vol. 13, No. 2, pp. 137-166. January,
1905.
15. The Effects of the Roentgen Ray upon Cancer — Robert H. Vose and
Walter C. Howe.
Journal of Medical Research, Vol. 13, No. 2, pp. 167-185. January,
1905.
16. Implantation of Tissue and Its Relation to Cancer — E. H. Nichols.
Journal of Medical Research, Vol. 13, No. 2, pp. 187-232. January,
1905.
17. The Inoculable Tumors in Mice — E. E. Tyzzer.
Journal of Medical Research, Vol. 17, No. 2, pp. 137-153. November,
1907.
18. A Series of Twenty Spontaneous Tumors in Mice, with the Accompanying
Pathological Changes and the Results of the Inoculation of Certain
of These Tumors into Normal Mice — E. E. Tyzzer.
Journal of Medical Research, Vol. 17, No. 2, pp. 155-157. November,
1907.

19. A Study of Heredity in Relation to the Development of Tumors in Mice — E. E. Tyzzer.
Journal of Medical Research, Vol. 17, No. 2, pp. 199-211. November, 1907.
20. A Transmissible Cancer of the Rat Considered from the Standpoint of Immunity — F. P. Gay.
Journal of Medical Research, Vol. 20, No. 1, pp. 175-201. January, 1909.
21. The Lesions of the Skin and the Tumor Formations in Xeroderma Pigmentosum — W. T. Councilman and G. B. Magrath.
Journal of Medical Research, Vol. 21, No. 3, pp. 331-355. October, 1909.
22. The Surgical Treatment of X-ray Carcinoma and Other Severe X-ray Lesions based upon an Analysis of Forty-Seven Cases — C. A. Porter.
Journal of Medical Research, Vol. 21, No. 3, pp. 357-413. October, 1909.
23. The Pathological Histology of Chronic X-ray Dermatitis and Early X-ray Carcinoma — S. B. Wolbach.
Journal of Medical Research, Vol. 21, No. 3, pp. 415-449. October, 1909.
24. Chronic Pancreatitis with Tumor-like Nodules in the Cat — Thomas Ordway.
Journal of Medical Research, Vol. 21, No. 3, pp. 451-458. October, 1909.
25. Tumors in the Common Fowl — E. E. Tyzzer and Thomas Ordway.
Journal of Medical Research, Vol. 21, No. 3, pp. 459-477. October, 1909.
26. A Series of Spontaneous Tumors in Mice with Observations on the Influence of Heredity on the Frequency of Their Occurrence — E. E. Tyzzer.
Journal of Medical Research, Vol. 21, No. 3, pp. 479-518. October, 1909.
27. A Study of Inheritance in Mice with Reference to Their Susceptibility to Transplantable Tumors — E. E. Tyzzer.
Journal of Medical Research, Vol. 21, No. 3, pp. 519-573. October, 1909.
28. The Nature of the Reaction of the Tissues of Susceptible and Non-Susceptible Mice to an Inoculable Tumor — A. M. Burgess.
Journal of Medical Research, Vol. 21, No. 3, pp. 575-590. October, 1909.
29. The Effect of Trypsin on Cancer and on the Germ Cells in Mice — Stephen Rushmore.
Journal of Medical Research, Vol. 21, No. 3, pp. 591-596. October, 1909.
30. The Treatment of Cancer with Body Fluids and Cancerous Ascitic Fluid — E. H. Risley.
Journal of the American Medical Association, Vol. 56, pp. 1383-1389. May 13, 1911.
31. The Hemolytic Skin Reactions in Carcinoma — E. H. Risley.
The Boston Medical and Surgical Journal, Vol. 165, No. 4, pp. 127-128. July 27, 1911.
32. The Gilman-Coca Vaccine Emulsion Treatment of Cancer — E. H. Risley.
The Boston Medical and Surgical Journal, Vol. 165, No. 21, pp. 784-788. November 23, 1911.
33. The Huntington Hospital and the Scope of Its Work — E. E. Tyzzer and Thomas Ordway.
Boston Medical & Surgical Journal, Vol. 166, No. 2, pp. 887-889. June 13, 1912.

34. Tumor Investigation — A General View of Various Lines of Activity — E. E. Tyzzer.
Harvard Graduates' Magazine, Vol. 21, No. 82. December, 1912.
35. The Collis P. Huntington Hospital for Cancer Research — Robert B. Greenough and Thomas Ordway.
Harvard Graduates' Magazine, Vol. 21, No. 82. December, 1912.
36. Factors in the Production and Growth of Tumor Metastases — E. E. Tyzzer.
Journal of Medical Research, Vol. 28, No. 2, pp. 309-332. July, 1913.
37. The Complement Content of the Blood in Malignant Disease — Thomas Ordway and Ellis Kellert.
Journal of Medical Research, Vol. 28, pp. 287-299. July, 1913.
38. The Protein Metabolism in Certain Tumor-bearing Rats — Thomas Ordway and J. Lucien Morris.
Journal of Medical Research, Vol. 28, No. 2, pp. 301-308. July, 1913.
39. The Use of Radium in Cancer and Allied Conditions at the Huntington Hospital — Illustrative Cases. A report of the Cancer Commission of Harvard University, presented by Thomas Ordway.
Boston Medical and Surgical Journal, Vol. 171, No. 21, pp. 771-781. November 19, 1914.
40. Carcinoma, Syphilis, and Tuberculosis Co-existent in the Same Patient, with Report of a Case — Ellis Kellert.
Journal of the American Medical Association, 1914, Vol. 63, p. 1819.
41. The Importance of Inflammation in the Immunity of Mice to Implanted Tumor — E. E. Tyzzer.
Journal of Medical Research, Vol. 32, pp. 201-223. May, 1915.
42. Radioactive Substances in the Treatment of Cancer — William Duane.
Harvard Graduates' Magazine, June, 1915. (No reprints.)
43. The Tumors of the Japanese Waltzing Mouse and of Its Hybrids — E. E. Tyzzer.
Journal of Medical Research, Vol. 32, pp. 331-360. July, 1915.
44. On the Extraction and Purification of Radium Emanation — William Duane.
Physical Review, N. S., Vol. 5, pp. 311-326. April, 1915.
45. Cancer Research. Problems and Methods of Investigation — E. E. Tyzzer.
St. Paul Medical Journal, Vol. 17, pp. 481-487. July, 1915.
46. A Direct Reading Potentiometer for Measuring and Recording both the Actual and the Total Reaction of Solutions — W. T. Bovie.
Journal of Medical Research, Vol. 33, pp. 295-322. November, 1915.
47. Further Experimental Studies on the Inheritance of Susceptibility to a Transplantable Tumor, Carcinoma (J. w. A.) of the Japanese Waltzing Mouse — C. C. Little and E. E. Tyzzer.
Journal of Medical Research, Vol. 33, pp. 393-453. January, 1916.
48. On X-ray Wave-Lengths — William Duane and Franklin L. Hunt.
Physical Review, August, 1915.
49. Tumor Immunity — E. E. Tyzzer.
Journal of Cancer Research, Vol. 1, No. 2, April, 1916, pp. 125-155.
50. Planck's Radiation Formula deduced from Hypotheses suggested by X-ray Phenomena — William Duane.
Physical Review, N. S., Vol. 7, No. 1, p. 143. January, 1916.
51. An Active Modification of Hydrogen Produced by Alpha Rays — William Duane and Gerald Wendt.
Abstract in Physical Review, N. S., Vol. 7, No. 6, June, 1916.
52. The Action of Light on Protoplasm — W. T. Bovie.
American Journal of Tropical Diseases and Preventive Medicine, Vol. 2, No. 8, February, 1915, pp. 506-517.
53. The Biological Effects of Radium Rays — W. T. Bovie.
Journal of Cancer Research, Vol. 1, No. 3, p. 396.

54. Studies on the Inheritance of Susceptibility to a Transplantable Sarcoma (J. w. B.) of the Japanese Waltzing Mouse — E. E. Tyzzer and C. C. Little.
Journal of Cancer Research, Vol. 1, No. 3, p. 387.
55. A Rapid Method for Determining Calcium in Blood and Milk — Henry Lyman.
Journal of Biological Chemistry, Vol. 29, No. 2, p. 169. March, 1917.
56. A Reactive Modification of Hydrogen Produced by Alpha Radiation — William Duane and Gerald L. Wendt.
Physical Review, August, 1917.
57. Value of the Constant h Determined by Means of X-rays — F. C. Blake and William Duane.
Physical Review, December, 1917.
58. High-Frequency Absorption Spectra of the Chemical Element — F. C. Blake and William Duane.
Physical Review, December, 1917.
59. Radium in the Treatment of Cancer — William Duane.
Proceedings of the Second Pan-American Scientific Congress, Vol. 10, p. 503.
60. Report of Results of Radium Treatment at the Collis P. Huntington Memorial Hospital, by the Cancer Commission of Harvard University — William Duane and Robert B. Greenough.
Boston Medical and Surgical Journal, September 13, 1917, Vol. 177, No. 11, pp. 359-365.
61. Methods of Preparing and Using Radioactive Substances in the Treatment of Malignant Disease, and of Estimating Suitable Dosages — William Duane.
Boston Medical and Surgical Journal, December 6, 1917, Vol. 177, No. 23, pp. 787-799.
62. Hodgkin's Disease: A Report on the Cases Observed at the Collis P. Huntington Memorial Hospital, from April, 1913, to July, 1916, with Special Reference to Treatment with Radium and X-ray — Channing C. Simmons and George Benet.
Boston Medical and Surgical Journal, December 13, 1917, Vol. 177, No. 24, pp. 819-834.
63. Report on the Treatment of Myelogenous Leukemia with Radium — Francis W. Peabody.
Boston Medical and Surgical Journal, December 20, 1917, Vol. 177, No. 25, pp. 873, 874.
64. Report of Treatment of Carcinoma of Cervix at the Huntington Hospital for Period of Four Years — Edward H. Risley and George A. Leland, Jr.
Boston Medical and Surgical Journal, December 27, 1917, Vol. 177, No. 26, pp. 891-894.
65. Sterilization of Surgeons' Knives and Scissors by Heating in Liquid Petrolatum — Henry Lyman.
The Journal of the American Medical Association, June 23, 1917, Vol. 68, 1907, 1908.
66. Radium in the Treatment of Carcinoma of the Buccal Cavity — Robert B. Greenough.
Boston Medical and Surgical Journal, May 2, 1918, Vol. 178, pp. 598-602.
67. Delay in the Surgical Treatment of Cancer — Channing C. Simmons.
Boston Medical and Surgical Journal, November 21, 1918, Vol. 179, pp. 639-641.
68. Abstract — The Relation Between the K X-ray Series and the Atomic Numbers of the Chemical Element — William Duane and Kang-Fu Hu.
69. Abstract — The Critical Absorption and Characteristic Emission X-ray Frequencies — William Duane and Kang-Fu Hu.
Physical Review, June, 1918.

70. Abstract — The Relation Between the General X-radiation and the Atomic Number of the Target — William Duane.
Physical Review, June, 1918.
71. Sensitization to Heat Due to Exposure to Light of Short Wave-Lengths — W. T. Bovie and Alice Klein.
Journal of General Physiology, Vol. 1, No. 3, pp. 331-336. January, 1919.
72. Rate of Recovery from Action of Fluorite Rays — W. T. Bovie and D. M. Hughes.
Journal of General Physiology, Vol. 1, No. 3, pp. 323-329. January, 1919.
73. The Physiological Action of Radiation — W. T. Bovie.
Journal of Medical Research, Vol. 39, pp. 271-277. November, 1918.
74. The Approximation of the Values of the Absorption Index of Fluorite Rays in Protoplasm — W. T. Bovie.
Journal of Medical Research, Vol. 39, pp. 239-249. November, 1918.
75. The Location of the Physiological Effects of Radiation within the Cell — W. T. Bovie.
Journal of Medical Research, Vol. 39, pp. 251-265. November, 1918.
76. The Effects of Fluorite Ultra-Violet on the Rate of Division of Paramecium Caudatum — W. T. Bovie and D. M. Hughes.
Journal of Medical Research, Vol. 39, pp. 233-238. November, 1918.
77. The Effects of Quartz Ultra-Violet on the Rate of Division of Paramecium Caudatum — W. T. Bovie and D. M. Hughes.
Journal of Medical Research, Vol. 39, pp. 223-231. November, 1918.
78. On the Critical Absorption Frequencies of the Chemical Elements of High Atomic Numbers — William Duane and Takeo Shimizu.
Physical Review, Vol. 13, p. 159. February, 1919.
79. Are the Frequencies in the K Series of X-rays the Highest Frequencies as Characteristic of a Chemical Element — William Duane and Takeo Shimizu.
Physical Review, Vol. 13, p. 289. April, 1919.
80. On the Relation between the K Series and L Series of X-rays — William Duane and Takeo Shimizu. (Abstract of No. 82.)
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